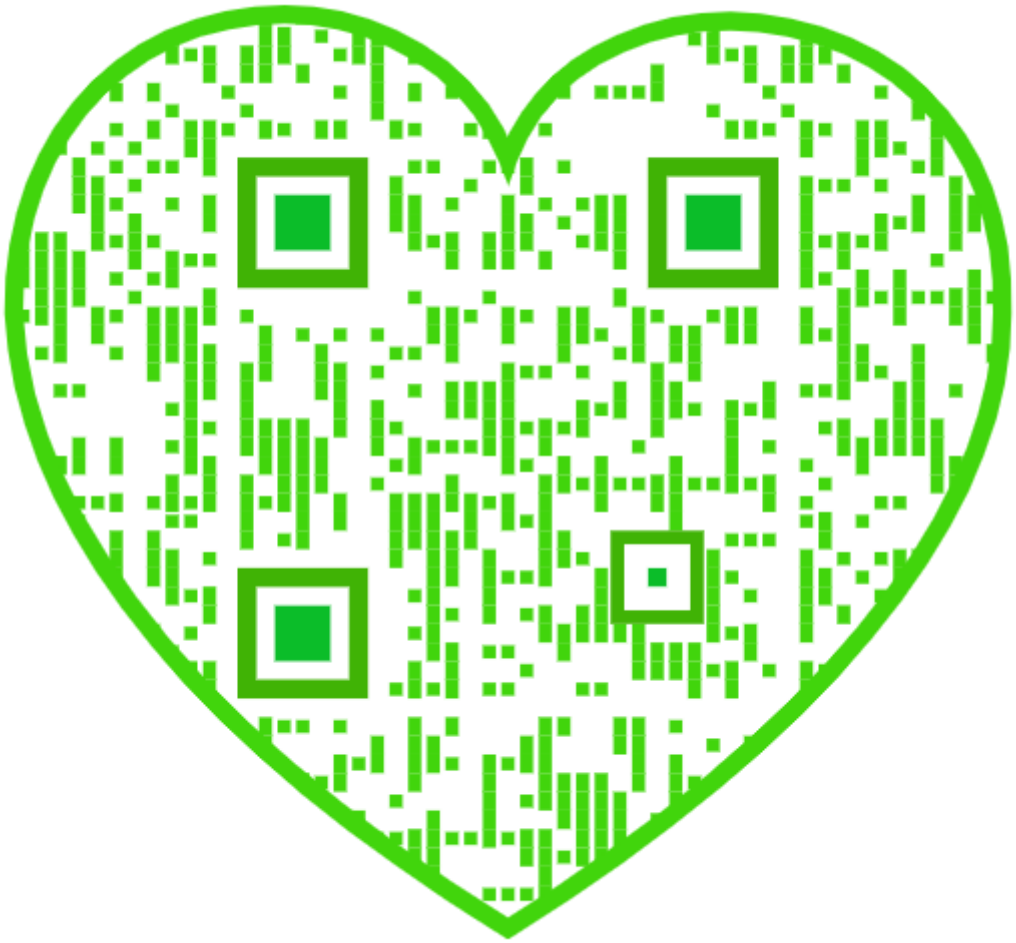

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THE WORK OF JOHN GALEN HOWARD

JANVARY MCMXV

1915

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> "I am very agreeably surprised at the extent of the marble beds here and their development. I regard the stone as of a very high grade and of exceptional beauty. It is remarkable for its translucency and for its clear white tones. In this respect it is not excelled by any white marble in America, and I can recall none of the foreign deposits which excel it. * * * * The stone is of exceptional beauty, and if adopted should give a structure without a rival."

This decision was approved by the Secretary of War and also by the Fine Arts Commission, consisting of Daniel C. French, Frederick Law Olmstead, Cass Gilbert, Edwin H. Blashfield and others. The contract was awarded at a preference of over $300,000.00.

The Colorado Yule Marble has also been approved for the interior of the new San Francisco City Hall and the new Sub-Treasury Building, San Francisco.

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Carbonate of Magnesium $MgCO_3$	0.15%
Silica, Insoluble	0.04%
Iron Fe Traces	
	99.98%

The marble contains no foreign constituents in sufficient amount to be liable to occasion appreciable discoloration or disintegration on weathering.

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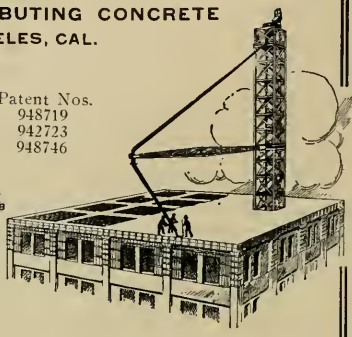

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Ferguson Building, Los Angeles; Columbia Hospital Building, Los Angeles; Exposition Building for the State Agricultural Park, Los Angeles; Sweetwater Dam, San Diego, Cal.; Edison Electric Co., Three Warehouses, Long Beach; Spreckels Theatre and Office Building, San Diego, Cal.; L. H. Sly Apartment House, California and Powell Streets; 21st Viaduct, Portland, Oregon (International Contract Co., Contractors); South Pasadena Bridge, Los Angeles, Cal. (T. H. Howard, Contractor); Three Acres Car Barns for Los Angeles Railway Co. (E. J. Kubach, Contractor); Mary Andrews Clark Memorial Building, Los Angeles, Cal. (G. H. Whyte, Contractor). The Garland Theatre and Office Building, Los Angeles, Cal. (National Fireproofing Company, Contractors); Tempe Bridge, Phoenix, Arizona.

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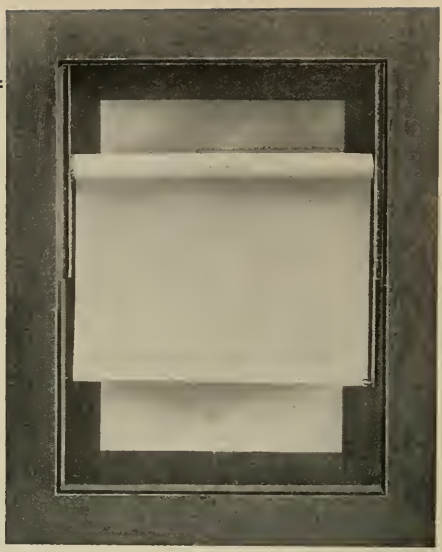

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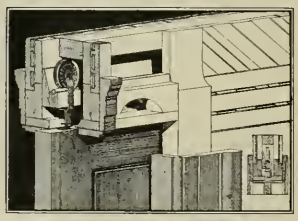

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Biturine Co., of America, 24 California St., San Francisco.
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Imperial Waterproofing, manufactured by Imperial Co., 183 Stevenson St., San Francisco.
Trus-Con Par-Seal, made by Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and Tibbetts-Oldfield Co., Los Angeles.

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Biturine Company of America, 24 California St., San Francisco.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents on page 31.)
Glidden"s Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier Coburn Co., San Francisco, and Tibbetts-Oldfield Co., Los Angeles.
Dry Mortar Colors sold by E. A. Bullis & Co. (See advertisement, page 26.)
Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., San Francisco.
Concrete Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING

Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents on page 31.)
Glidden's Concrete Floor Dressing, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and Tibbetts-Oldfield Co., Los Angeles.
Moller & Schumann Co., Hilo Varnishes, 1022 Mission St., San Francisco.
"Federal Steel Cement Hardener" manufactured by Federal Steel Cement Mills, Cleveland, represented by E. A. Bullis & Co. (See advertisement, page 26.)

CEMENT TESTS—CHEMICAL ENGINEERS

Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS

Fink & Schindler, 218 13th St., San Francisco.

CHUTES—GRAVITY SPIRAL

Gravity Spiral Chutes by Minnesota Manufacturers' Association. G. E. Sturgis, Agt., 602 Mission St., San Francisco.

CEMENT MORTAR HARDENER

"Federal Steel Cement Hardener" manufactured by Federal Steel Cement Mills, Cleveland, represented by E. A. Bullis & Co. (See advertisement, page 26.)

COLD STORAGE PLANTS

Vulcan Iron Works, San Francisco.
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

CLOCKS—TOWER

Decker Electrical Construction Co., 111 New Montgomery St., San Francisco.

COMPOSITION FLOORING

Fibrestone & Roofing Co., 971 Howard St., San Francisco.

COMPRESSED AIR CLEANERS

The B. & W. Stationary Vacuum Cleaner, sold by Arthur T. Riggs, 510 Claus Spreckels Bldg., San Francisco.
Excello Stationary Vacuum Cleaner, F. W. Schaer Co., Pacific Coast Agts., Santa Maria Bldg., San Francisco.
Giant Stationary Suction Cleaner, San Francisco and Oakland.
Invincible Vacuum Cleaner, sold by R. W. Foyle, 149 New Montgomery St., San Francisco.
Tuec., mfrd. by United Electric Company, Coast Branch, General Contractors' Association, San Francisco.

CONCRETE CONSTRUCTION

American Concrete Co., Humboldt Bank Bldg., San Francisco.
Clinton Fireproofing Co., Mutual Bank Bldg., San Francisco.
McKibben & Taylor, 2125 Shattuck Ave., Berkeley.
Otto, W. H., 269 Park Ave., San Jose.
Barrett & Hilp, Sharon Bldg., San Francisco.
Foster, Vogt Co., Sharon Bldg., San Francisco.
P. A. Palmer, Monadnock Bldg., San Francisco.
Ransome Concrete Co., Oakland and Sacramento.
International Concrete Construction Company, West Berkeley, Cal.

CONCRETE HARDENERS

"Federal Steel Concrete Hardener," mfd. by Federal Steel Cement Mills, Cleveland, Ohio, sold by E. A. Bullis & Co. (See ad., p. 26.)

CONCRETE MIXERS

Austin Improved Cube Mixer. Factory branch, temporary office, 1235 Pine St., San Francisco.
Foote Mixers sold by Edw. R. Bacon, 40 Natoma St., San Francisco.

Underwriters' Labelled Fire Doors and Windows—Kalamein Interior Metal Doors and Trim — Metal Corner Bead — Metal Furniture, etc.

Capitol Sheet Metal Works INC.

Manufacturer of

SHEET METAL PRODUCTS

San Francisco Office and Factory, 1927-1935 MARKET STREET
Oakland Office and Factory, 117-119 FRANKLIN STREET

Telephone Sutter 4765

GASPARD & HAMMOND

BUILDING CONSTRUCTION

425 Sharon Building, 55 New Montgomery St. San Francisco, Cal.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONCRETE PILES
McArthur Concrete Pile Company, Chronicle Building, San Francisco.

CONCRETE POURING APPARATUS
Concrete Appliances Co., Los Angeles; Parrott & Co., Coast Representatives, San Francisco, Portland, Seattle.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Clinton Welded Reinforcing System. L. A. Norris, 140 Townsend St., San Francisco.
"Kahn System," see advertisement on page 31, this issue.
International Fabric & Cable, represented by Western Builders' Supply Co., 155 New Montgomery St., San Francisco.
Triangle Mesh Fabric. Sales Agents, Pacific Building Materials Co., 523 Market St., San Francisco.
Twisted Bars, sold by Woods & Huddart, 444 Market St., San Francisco.

CONCRETE SURFACING
"Biturine," sold by Biturine Co. of America, 24 California St., San Francisco.
"Concreta" sold by W. P. Fuller & Co., San Francisco.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating, sold by R. N. Nason & Co., San Francisco and Los Angeles.
Glidden Liquid Cement, manufactured by Glidden Varnish Co., Whittier, Coburn Co., San Francisco, and Tibbetts-Oldfield Co., Los Angeles.
Moller & Schumann, 1023 Mission St., San Francisco.

CONTRACTORS, GENERAL
American Concrete Co., Humboldt Bank Bldg., San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Arthur W. Biggers, 112 Market St., San Francisco.
Collman & Collman, 526 Sharon Bldg., San Francisco.
Construction & Engineering Co., Hobart Bldg., San Francisco.
M. Fisher, California-Pacific Bldg., San Francisco.
Foster, Vogt Co., Sharon Bldg., San Francisco.
Gaspard & Hammond, Sharon Bldg., San Francisco. (See card above.)
Howard S. Williams, Hearst Bldg., San Francisco.
Lester Stock, 12 Geary St., San Francisco.
McLaren & Peterson, Sharon Bldg., San Francisco.
R. W. Moller, 185 Stevenson St., San Francisco.
John Monk, 2016 Vallejo St., San Francisco.
Monson Bros., 1907 Bryant St., San Francisco.
Burt T. Owsley, 311 Sharon Bldg., San Francisco.
Ransome Concrete Co., 1218 Broadway, Oakland.
Sound Construction Co., Hearst Building, San Francisco.
Western Building & Engineering Co., 455 Phelan Bldg., San Francisco.
Williams Bros. & Henderson, Holbrook Bldg., San Francisco.

CORK FLOORING
"Linotile," manufactured by Armstrong Cork & Insulation Company. M. C. Van Fleet, agt., 120 Jessie St., San Francisco.

CORNER BAR
Dolbear Curb Bar, manufactured by American Steel Bar Co., 1034 Merchants Exchange Bldg., San Francisco.

CORNER BEAD
United States Metal Products Co., 525 Market St., San Francisco.; 750 Keller St., San Francisco.

CRUSHED ROCK
Grant Gravel Co., Flat Iron Bldg., San Francisco.
Niles Rock, sold by California Building Material Company, Pacific Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.

DAMP-PROOFING COMPOUND
Biturine Co. of America, 24 California St., San Francisco.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and Tibbetts-Oldfield Co., Los Angeles.
Imperial Co., 183 Stevenson St., San Francisco.
"Impervite," sold by E. A. Bullis & Co. (See adv. on page 26.)
Trus-Con Damp Proofing. (See advertisement of Trussed Concrete Steel Company for Coast agencies.)
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS
McCabe Hanger Mfg. Co., New York, N. Y.
Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.

DRINKING FOUNTAINS
Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
N. O. Nelson Mfg. Co., 978 Howard St., San Francisco.
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 173 Beale St., San Francisco.
Burdett-Rowntree Mfg. Co., Underwood Bldg., San Francisco.

ELECTRICAL CONTRACTORS
Butte Engineering Co., 683 Howard St., San Francisco.
Central Electric Co., 185 Stevenson St., San Francisco.
Scott Co., Inc., 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

MORTENSON CONSTRUCTION CO.

CONTRACTORS FOR STRUCTURAL STEEL AND IRON

H. MORTENSON, PRES. CHAS. G. MORTENSON VICE-PRES. AND MGR.

OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS

PHONES: MISSION 5033—HOME M 3916 SAN FRANCISCO, CAL.

"FIBRESTONE"

SANITARY FLOORING, WAINSCOT AND BASE. Laid Exclusively by
FIBRESTONE & ROOFING CO., 971 Howard St. San Francisco Tel. Sutter 329

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELECTRICAL ENGINEERS
Albert E. Noble, 173 Jessie St., San Francisco.
Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC FIXTURES
Roberts Manufacturing Company, 663 Mission St., San Francisco.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.
San Francisco Elevator Co., 860 Folsom St., San Francisco.
Pacific Gurney Elevator Co., 186 Fifth St., San Francisco.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co., Underwood Bldg., San Francisco

ENGINEERS
F. J. Amweg, 700 Marston Bldg., San Francisco.
W. W. Breite, Clunie Bldg., San Francisco.
L. M. Hausmann, Sharon Bldg., San Francisco.
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., Underwood Bldg., San Francisco.

FIRE EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices, Vonnegut Hardware Co. (See Adv. for Coast Agencies.)

FIRE ESCAPES
Burnett Iron Works, Fresno, Cal.
Pacific Structural Iron Works, Structural Iron and Steel. Fire Escapes, etc. Phone Market 1374; Home J. 3435. 370-84 Tenth St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIRE BRICK
Livermore Fire Brick Co., Livermore, Cal.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces. Colonial Fireplace Co., Chicago. (See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles

FIREPROOF PAINT
Glidden Products, sold by Whittier-Coburn Co., San Francisco, and Tibbetts-Oldfield Co., Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
Fink & Schindler, 218 13th St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.
T. H. Meek Co., 1157 Mission St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
Moller & Schumann Co., 1022 Mission St., San Francisco.
Glidden Products, sold by Whittier-Coburn Co., San Francisco, and Tibbetts-Oldfield Co., Los Angeles.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., San Francisco.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.

GARDEN FURNITURE
G. Tomagnini & Co., 219 Tenth St., San Francisco.
O. S. Sarsi, 123 Oak St., San Francisco.

GAS AND ELECTRIC FIXTURES
Roberts Manufacturing Company, San Francisco and Oakland.

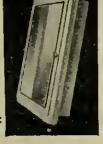
GAS GENERATORS
Utility Gas Generator Co., 340 Sansome St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier-Coburn Co., Howard & Beale Sts., San Francisco.

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
Raymond Granite Co., Division and Potrero Sts., San Francisco.

GRAVEL, SAND AND CRUSHED ROCK
California Building Material Co., Pacific Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.

GRAVITY CHUTES
Gravity Spiral Chutes, sold by G. E. Sturgis' Supply House, 602 Mission St., San Francisco.



"White-Steel" Medicine Cabinets and Mirrors are the last word in Sanitary Bathroom Equipment. See Sweet's 1914 Catalog, Pages 1054-1055 or write for full information.

"WHITE-STEEL" SANITARY FURNITURE CO.
Grand Rapids, Michigan

Northern California
Johnson-Locke Mercantile Co.
San Francisco, Calif.

Southern California
H. R. Boynton Company
Los Angeles, Calif.

CLARENCE E. MUSTO. Pres. JOSEPH B. KEENAN. Vice-Pres. GUIDO J. MUSTO. Sec'y & Treas.

JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin —6365— **MARBLE** OFFICE AND MILLS: 535-565 North Point St., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWALL PLASTER
- Henry Cowell Lime & Cement Co., San Francisco.
- American Keene Cement Co., 333 Monadnock Bldg., San Francisco.
- "Empire" Hardwall Plaster, Pacific Portland Cement Company, Pacific Bldg., San Francisco.

HARDWARE
- Russwin Hardware, Joost Bros., San Francisco.
- Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, Los Angeles and San Diego.
- Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.
- Western Brass Mfg. Co., 217 Tehama St., S. F.

HARDWOOD FLOORING
- Parrott & Co., 320 California St., San Francisco
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.
- Hardwood Interior Co., 554 Bryant St., San Francisco.

HARDWOOD LUMBER
- Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
- Parrott & Co., 320 California St., San Francisco.
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.

HEATERS—AUTOMATIC
- Pittsburg Water Heater Co., 237 Powell St., San Francisco.
- Hoffman Heaters, factory branch, 397 Sutter St., San Francisco.

HEATING AND VENTILATING
- American Heat & Power Co., Oakland, Cal.
- J. M. Boscus, 975 Howard St., San Francisco.
- Fess System Co., 220 Natoma St., San Francisco.
- Mangrum & Otter, Inc., 507 Mission St., San Francisco.
- Charles T. Phillips, Pacific Building, San Francisco.
- Scott Company, 243 Minna St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
- Petersen-James Co., 710 Larkin St., San Francisco.

HOLLOW BLOCKS
- Denison Hollow Interlocking Blocks, 310 Ochsner Bldg., Sacramento, and Chamber of Commerce Bldg., Portland.

INSPECTIONS AND TESTS
- Robert W. Hunt & Co., 251 Kearny St., San Francisco.

IRONING BOARDS
- Merritt Patent Ironing Board, sold by A. Hommel, agent, Atlanta Hotel, San Francisco.

JOIST HANGERS
- Western Builders' Supply Co., 155 New Montgomery St., San Francisco.

KEENE CEMENT
- American Keene Cement Co., Monadnock Bldg., San Francisco.

LIGHTING FIXTURES
- Roberts Manufacturing Co., 663 Mission St., San Francisco.

LIME
- Henry Cowell Lime & Cement Co., 9 Main St., San Francisco.

LIGHT, HEAT AND POWER
- Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.

LUMBER
- Dudfield Lumber Co., Palo Alto, Cal.
- Sunset Lumber Co., Oakland, Cal.
- Santa Fe Lumber Co., Seventeenth and De Haro Sts., San Francisco.
- E. K. Wood Lumber Company, East Oakland, California.

MILL WORK
- Totten & Brandt Planing Mill Co., Stockton.
- Taylor & Co., 2001 Grand St., Alameda.

MAIL CHUTES
- Cutler Mail Chute Co., Rochester, N. Y. (See Adv. on page 38 for Coast representatives.)

MANTELS
- Mangrum & Otter, 561 Mission St., San Francisco.

MARBLE
- Colorado Yule Marble Co., Monadnock Bldg., San Francisco.
- Schoenfeld Marble Company, San Francisco. (See advertisement, page 154.)
- Joseph Musto Sons-Keenan Co., 535 North Point St., San Francisco.
- G. Tomagnini & Co., 219 Tenth St., San Francisco.

MEDICINE CABINETS
- White Steel Sanitary Furniture Co., rep. by Johnson-Locke Mercantile Co., San Francisco.

METAL AND STEEL LATH
- "Steelcrete" Expanded Metal Lath, sold by Holloway Expanded Metal Company, Monadnock Bldg., San Francisco.
- L. A. Norris & Co., 140 Townsend St., San Francisco.

METAL CEILINGS
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
- U. S. Metal Products Co., 525 Market St., San Francisco.
- Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., San Francisco.

METAL FURNITURE
- M. G. West Co., 353 Market St., San Francisco.
- Chas. M. Finch, 311 Board of Trade Bldg., San Francisco.

METAL SHINGLES
- Meurer Bros., 630 Third St., San Francisco.
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

MORTAR COLORS
- Dry Mineral Dyes, sold by E. A. Bullis & Co. (See adv., page 26.)

OIL BURNERS
- American Heat & Power Co., Seventh and Cedar Sts., Oakland.
- S. T. Johnson Co. (see adv. below).
- Fess System Co., 220 Natoma St., San Francisco.
- T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.

HERE IT IS **MADE IN CALIFORNIA, TOO!**

A High Class Washable Paint for Inside Walls.

OPAQUE FLAT FINISH

Less material required to cover surface than any similar product on the market.

R. N. NASON & CO., 151-161 Potrero Avenue 54-56 Pine Street **SAN FRANCISCO**

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PASSENGER and FREIGHT ELEVATORS
INVESTIGATE OUR PRODUCT
SPENCER ELEVATOR COMPANY
126-128 Beale Street, SAN FRANCISCO Phone Kearny 664

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE
- American Art Metal Works, 13 Grace St., San Francisco.
- Brode Iron Works, 31-37 Hawthorne St., San Francisco.
- Burnett Iron Works, Fresno.
- Palm Iron & Bridge Works, Sacramento.
- California Artistic Metal & Wire Co., 349 Seventh St., San Francisco.
- J. G. Braun, Chicago and New York.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- Monarch Iron Works, 1165 Howard St., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., Sain Francisco.
- Shreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.
- Vulcan Iron Works, San Francisco.

PAINTING AND DECORATING
- D. Zelinsky, 564 Eddy St., San Francisco.
- Robert Swan, 1133 E. 12th St., Oakland.

PAINT FOR BRIDGES
- Biturine Company of America, 24 California St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.). (See Adv. in this issue for Pacific Coast agents.)
- "Biturine," sold by Buturine Co. of America, 24 California St., San Francisco.
- Trus-Con Stone Tex., Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Tibbetts-Oldfield Co., Los Angeles.
- Concreto Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
- Moller & Schumann Co., Hilo Varnishes, 1022 Mission St., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
- "Technola," a cement paint, sold by C. Roman, San Francisco.

PAINT FOR STEEL STRUCTURES
- "Biturine," sold by Biturine Co. of America, 24 California St., San Francisco.
- Carbonizing Coating. Made by Goheen Mfg. Co., Canton, Ohio. C. W. Coburn & Co., 320 Market St., San Francisco, and A. J. Capron, Ainsworth Bldg., Portland, Agents.
- Trus-Con Bar-Ox, Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and Tibbetts-Oldfield Co., Los Angeles.

PAINTS, OILS, ETC.
- Bass-Heuter Paint Co., Mission, near Fourth St., San Francisco.
- Whittier-Coburn Co., Howard and Beale Sts., San Francisco.
- W. P. Fuller & Co., all principal Coast cities.
- "Biturine," sold by Biturine Co. of America, 24 California St., San Francisco.
- Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., San Francisco and Tibbetts-Oldfield Co., Los Angeles.
- Moller & Schumann Co., 1022 Mission St., San Francisco.
- Paraffine Paint Co., 38-40 First St., San Francisco.
- R. N. Nason Co., San Francisco.
- Standard Varnish Works, 113 Front St., San Francisco.

PAVING BRICK
- California Brick Company, Phelan Bldg., San Francisco.

PHOTO ENGRAVING
- California Photo Engraving Co., 121 Second St., San Francisco.

PHOTOGRAPHY
- R. J. Waters Co., 717 Market St., San Francisco.

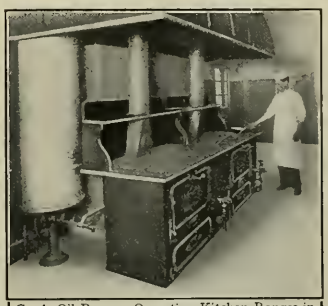
PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.
- Pacific Sewer Pipe Co., I. W. Hellman Bldg., Los Angeles.
- Pratt Building Material Co., Hearst Bldg., San Francisco.
- Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PLASTER CONTRACTORS
- A. Knowles, 985 Folsom St., San Francisco.

PLUMBERS' MARBLE HARDWARE
- Western Brass Mfg. Co., 217 Tehama St., S. F.

PLUMBING
- Boscus Bros., 975 Howard St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Peterson-James Co., 710 Larkin St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Alex Coleman, 706 Ellis St., San Francisco

PLUMBING FIXTURES, MATERIALS, ETC.
- Crane Co., Second and Brannan Sts., San Francisco.
- N. O. Nelson Mfg. Co., 978 Howard St., San Francisco.
- California Steam Plumbing Supply Co., 671 Fifth St., San Francisco.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Western States Porcelain Co., San Pablo, Cal.



Crude Oil Burners Operating Kitchen Ranges in Government Barracks at Fort Winfield Scott

OIL BURNERS
Modern EQUIPMENTS for Cooking and Heating Plants
S. T. JOHNSON CO.
1337 MISSION ST. SAN FRANCISCO
945 GRACE AVE. OAKLAND

Phone Lakeside 91

National Roofing Company

ROOFING AND COMPOSITION FLOORING

EVERYTHING IN ROOFING

PLAZA BUILDING, Fifteenth and Washington Streets, OAKLAND

ARCHITECTS' SPECIFICATION INDEX—*Continued*

POTTERY
- Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PUMPS
- Chicago Pump Company, 612 Howard street, San Francisco.

REFRIGERATORS
- McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.
- Vulcan Iron Works, San Francisco.

REVERSIBLE WINDOWS
- Hanser Reversible Window Company, Balboa Bldg., San Francisco.

REVOLVING DOORS
- Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROCK BREAKING MACHINERY
- Vulcan Iron Works, Francisco and Kearny Sts., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
- Pacific Building Materials Co., 523 Market St., San Francisco.
- C. F. Weber & Co., 365 Market St., San Francisco.
- Union Blind and Ladder Company, manufacturers of the Acme rolling partitions for churches and schools, 3535 Peralta St., Oakland.
- Kinnear Steel Rolling Doors, W. W. Thurston, agent, Rialto Bldg., San Francisco.
- Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles.

ROOFING AND ROOFING MATERIALS
- Biturine Co. of America, 24 California St., San Francisco.
- Grant Gravel Co., Flat Iron Bldg., San Francisco.
- Fibrestone & Roofing Co., 971 Howard St., San Francisco.
- National Roofing Company, Plaza Bldg., Oakland.
- "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
- Mackenzie Roof Co., 425 15th St., Oakland.
- United Materials Co., Crossley Bldg., San Francisco.

ROOFING TIN
- American Sheet & Tin Plate Co., Pacific Coast representatives, U. S. Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
- Meurer Bros., A. H. MacDonald, agent, 630 Third St., San Francisco.

SAFES, VAULTS, BANK EQUIPMENT
- M. G. West Co., 353 Market St., San Francisco.

SANITARY DRINKING FOUNTAINS
- N. O. Nelson Mfg. Co., 978 Howard St., San Francisco.
- Haws' Sanitary Drinking Faucet Co., 1808 Harmon St., Berkeley.

SANITARY BATH FIXTURE
- "Boudoir" bath tub, mfrd. by Improved Sanitary Fixture Co., 411 S. Los Angeles St., Los Angeles. Sold by all plumbing houses.

SASH CORD
- Regal Sash Cord, Louisville Selling Co. represented on Pacific Coast by Baker & Hamilton.
- Samson Cordage Works, manufacturers of Solid Braided Cords and Cotton Twines, 88 Broad St., Boston, Mass.

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- The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

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- U. S. Metal Products Co., 525 Market St., San Francisco.

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- Burnett Iron Works, Fresno, Cal.
- Central Iron Works, 621 Florida St., San Francisco.
- Dyer Bros., 17th and Kansas Sts., San Francisco.
- Brode Iron Works, 31 Hawthorne St., San Francisco.
- Judson Manufacturing Co., 819 Folsom St., San Francisco.
- Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
- J. L. Mott Iron Works, D. H. Gulick, agents, 135 Kearny St., San Francisco.
- Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
- Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J. 3435, 370-84 Tenth St., San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
- U. S. Steel Products Co., Rialto Bldg., San Francisco.
- Schreiber & Sons Co., represented by Western Builders Supply Co., S. F.
- Vulcan Iron Works, San Francisco.
- Western Iron Works, 141 Beale St., San Francisco.
- Woods & Huddart, 444 Market St., San Francisco.

STEEL PRESERVATIVES
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- Wadsworth, Howland & Co., Boston Mass. (See Adv. for Coast agencies.)

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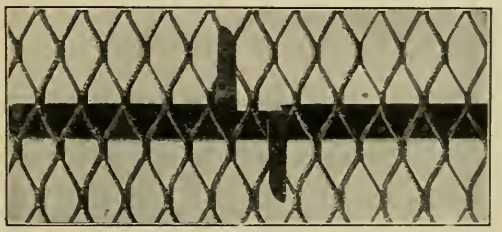

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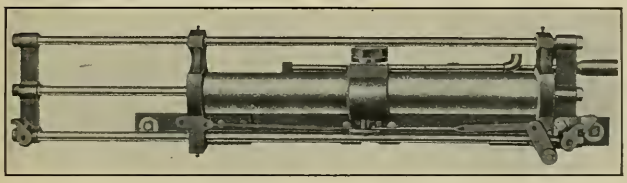

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Kahn and Rib Bars, made by Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
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STEEL ROLLING DOORS
Kinnear Steel Rolling Door Co., W. W. Thurston, Rialto Bldg., San Francisco.

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Boise Sandstone Co., Boise, Idaho.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.
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SURETY BONDS
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H. Y. MacMeans & Co., Monadnock Bldg., San Francisco.
Massachusetts Bonding & Insurance Co., First National Bank Bldg., San Francisco.
Fidelity & Deposit Co. of Maryland, Mills Bldg., San Francisco.
Pacific Coast Casualty Co., Merchants' Exchange Bldg., San Francisco.

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California Tile Contracting Company, 206 Sheldon Bldg., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.
The Mosaic Tile Co., 230 Eighth St., San Francisco.

TILE FOR ROOFING
Fibrestone & Roofing Co., 971 Howard St., San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
Denison Hollow Interlocking Blocks, Ochsner Bldg., Sacramento.
Thermos Brick Co., Monadnock Bldg., San Francisco.

TIN PLATES
American Tin Plate Co., Riato Bldg., San Francisco.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
Western States Porcelain Co., Richmond, Cal.

VACUUM CLEANERS
The Vak-Klean Vacuum Cleaner, Pneulectric Co., Pacific Coast Agts., 943 Phelan Bldg., San Francisco.
Giant Stationary Suction Cleaner, manufactured by Giant Suction Cleaner Co., 731 Folsom St., San Francisco and Third and Jefferson Sts., Oakland.
Invincible Vacuum Cleaner, R. W. Foyle, Agent, San Francisco.
"Excello" Stationary Vacuum Cleaner, F. W. Schaer Bros., Pacific Coast agents, Santa Maria Bldg., San Francisco.
"Tuec" Air Cleaner, manufactured by United Electric Co., 110 Jessie St., San Francisco.
B. & W. Stationary Vacuum Cleaner, sold by Arthur T. Riggs, 510 Claus Spreckels Bldg., San Francisco.

VALVES
Jenkins Bros., 247 Mission St., San Francisco.

VALVE PACKING
"Palmetto Twist," sold by H. N. Cook Belting Co., 317 Howard St., San Francisco.

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W. P. Fuller Co., all principal Coast cities.
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Standard Varnish Works, 113 Front St., San Francisco.
S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.
Moller & Schumann Co., Hilo Varnishes, 1022-24 Mission St., San Francisco.
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Hoffman Heater Co., Sutter St., San Francisco.
Radke Heaters, sold by Schaer Bros., 173 Jessie St., San Francisco.

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"Impervite," sold by E. A. Bullis & Co. (See adv. on page 26.)
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Fibrestone & Roofing Co., 971 Howard St., San Francisco.
Glidden's Concrete Floor Dressing and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Tibbetts-Oldfield Co., Los Angeles.
Imperial Co., 183 Stevenson St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The Building Material Co., Inc., 583 Monadnock Bldg., San Francisco.
Wadsworth, Howland & Co., Inc. (See Adv. for Coast agencies.)

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Trus-Con Sno-wite, manufactured by Trussed Concrete Steel Co. (See Adv. for Coast distributors.

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Whitney Adjustable Window Co., San Francisco. (See page 29.)
Hauser Reversible Window Co., Balboa Bldg., San Francisco.

WINDOW SHADES
Top Light Shade Co., 737 Market St., Oakland.

WIRE FABRIC
Wadsworth, Howland & Co., Inc. (See Adv. on page 31 for Coast agencies.)
U. S. Steel Products Co., Rialto Bldg., San Francisco.
L. A. Norris Co., 140 Townsend St., San Francisco.

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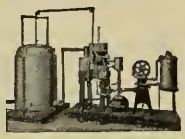

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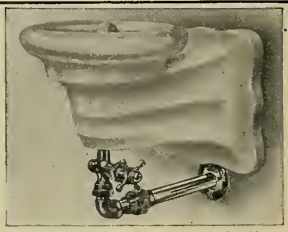

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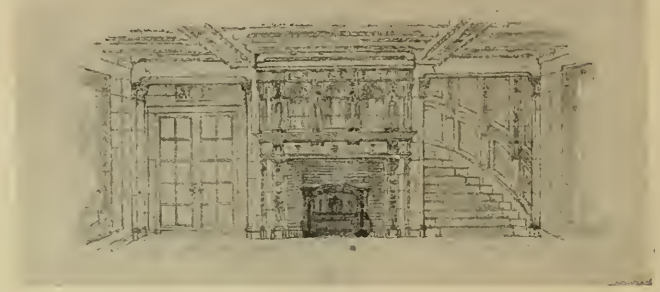

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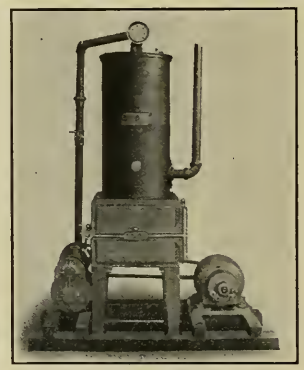

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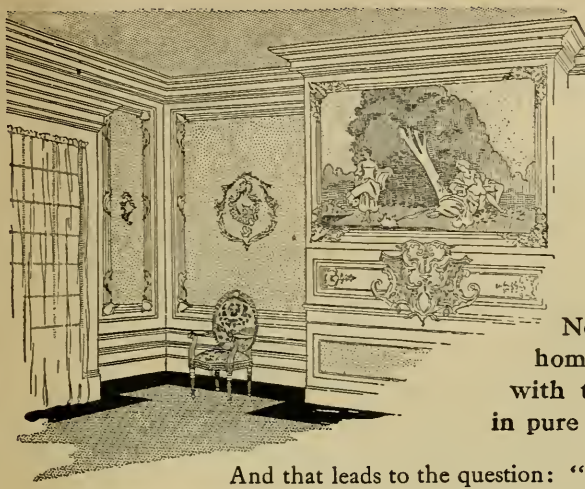

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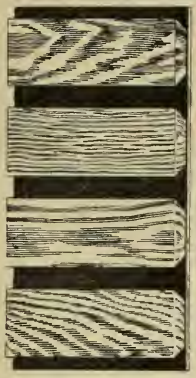

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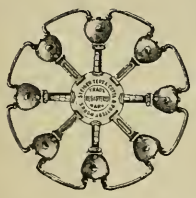

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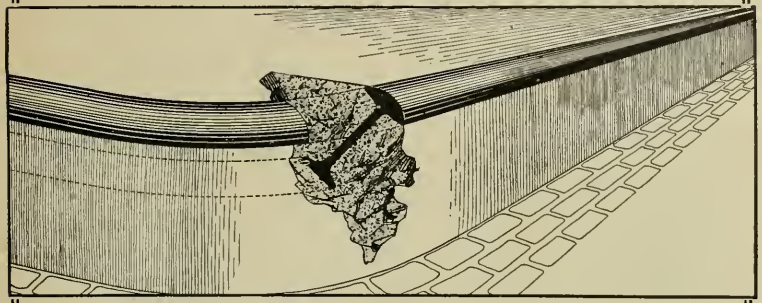

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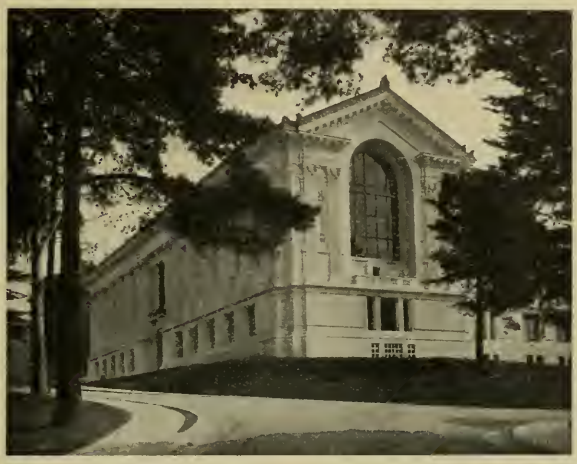

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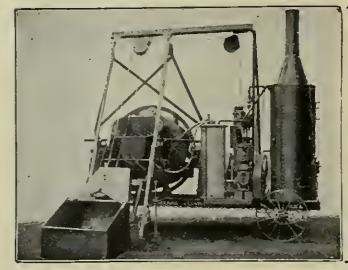

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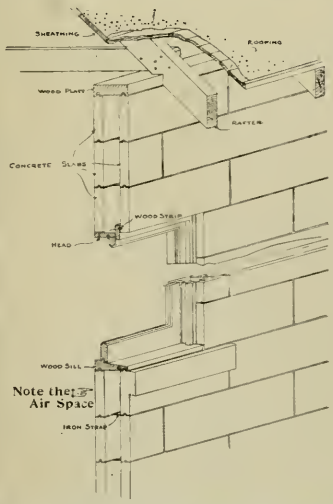

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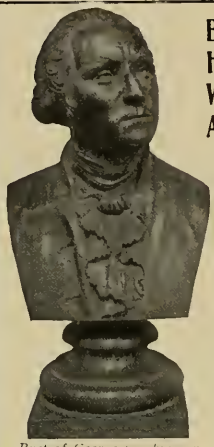

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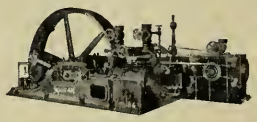

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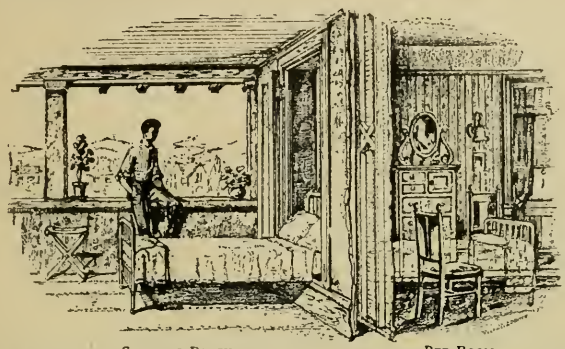

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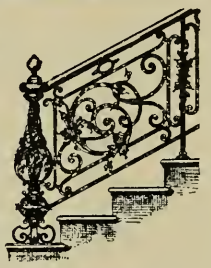

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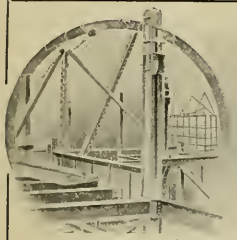

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VOL. XL. JANUARY, 1915 No. 1.

Some Architectural Works of John Galen Howard

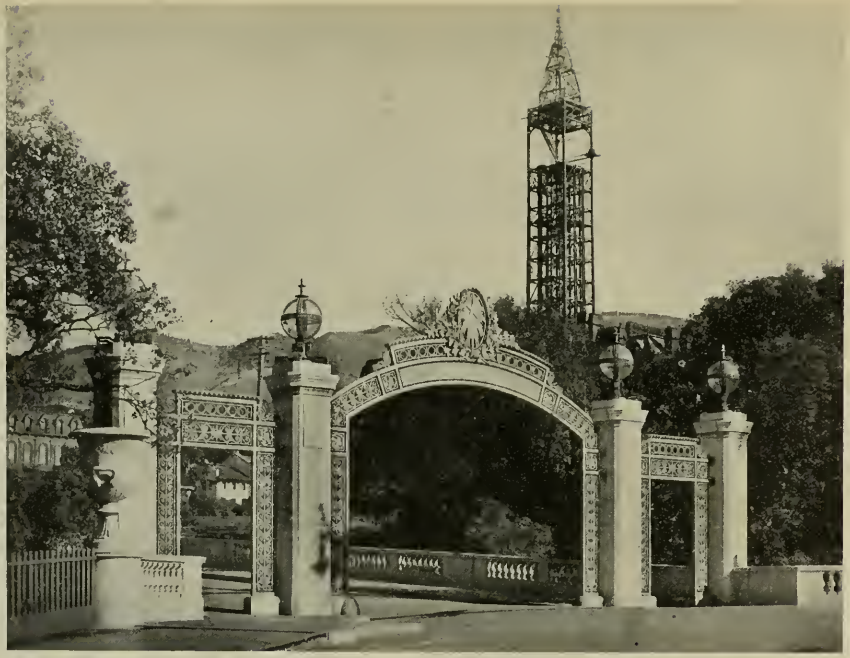
By WILLIAM C. HAYS, A. I. A.

IF it be true that music, poetry, painting, sculpture and architecture are but phases, all, of the very self's seeking utterance, then one finds here and there, even among moderns, the artist favored with power of expression through varied mediums. Such a man is he of whose buildings this sketch is written; so versatile that there is need to delimit the title chosen for any comment upon his works. Not only is he a busy practitioner; he is teacher and consulting expert as well. In quite another field, he has written essays and papers on both general and technical subjects which are a generous contribution to the world store. He is also a prolific author in belles lettres and it was Cass Gilbert who, speaking to the writer, said of Mr. Howard's most sustained work in verse, "This is a searching translation of the artist's attitude toward his work and the world." The poem "Brunelleschi" is not, as referred to by its author, merely "this imagined face," but is, rather, a stark innermost type-portrayal of the creative artist.

Without energy, enthusiasm, buoyancy and the labor that *is* love rather than *of* love, there cannot well be either inclination or capacity for so diverse work: these traits are his. An untiring, time-regardless worker, yet never hurried, never showing trace of the toil; many is the draftsman who has, day after day, and sometimes reluctantly, forfeited much of the lunch hour while his chief has studied and restudied with him the big conception or the minutest detail.

It is his executed buildings, however, with which we have to deal. The appointment to carry out the University Group was the magnet which drew Mr. Howard west. It will be remembered that in the Phoebe A. Hearst Architectural Competition for the University of California the first prize was won by Monsieur Emil Bénard, of Paris. After the competition M. Bénard was commissioned to make certain further studies of the general plan, but no arrangement was culminated for his coming from France to carry out any of the scheme. On the completion of M. Bénard's restudies the Regents of the University looked about for the properly qualified man to bring the buildings into reality and secured Mr. Howard, who had been one of the prize winners, to come and establish practice here. This he did, in the spring of 1902, maintaining an office in New York, however where a number of works were under way, until his final withdrawal in 1904.

THE PHOEBE APPERSON HEARST PLAN
UNIVERSITY OF CALIFORNIA
JOHN GALEN HOWARD, SUPERVISING ARCHITECT



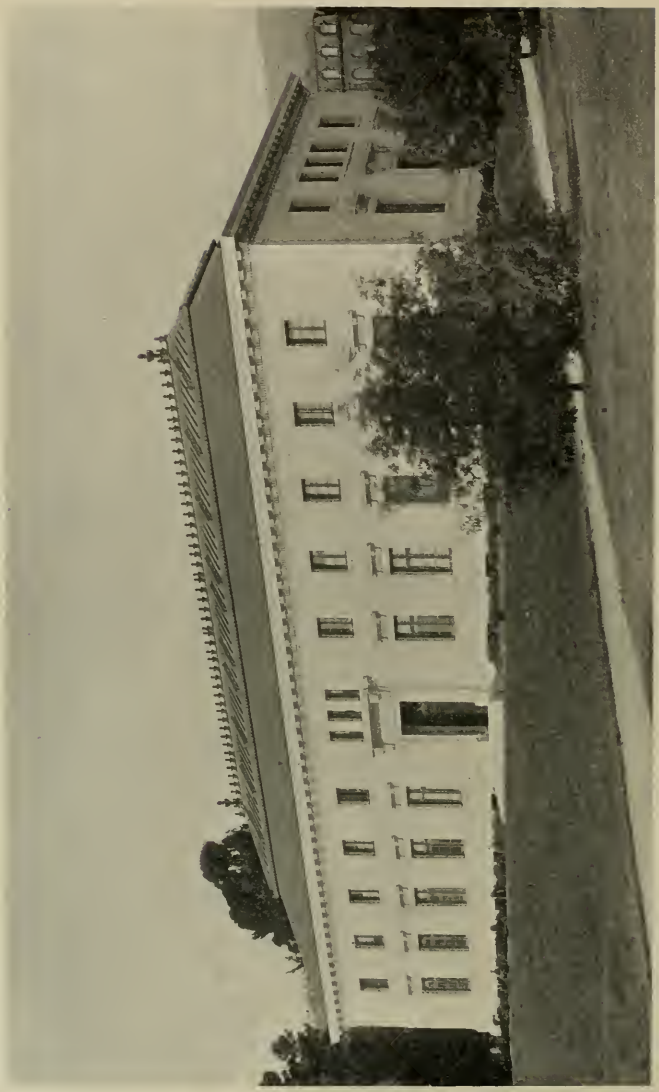
California Artistic Metal & Wire Company
Builders of the Gate.

SATHER GATE, UNIVERSITY OF CALIFORNIA
STEEL WORK OF SATHER TOWER
JOHN GALEN HOWARD, ARCHITECT

UNIVERSITY LIBRARY, UNIVERSITY OF CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT

CATALOGUE ROOM OF UNIVERSITY LIBRARY, UNIVERSITY OF CALIFORNIA
John Galen Howard, Architect

READING ROOM OF UNIVERSITY LIBRARY, UNIVERSITY OF CALIFORNIA
John Galen Howard, Architect



CALIFORNIA HALL, UNIVERSITY OF CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT

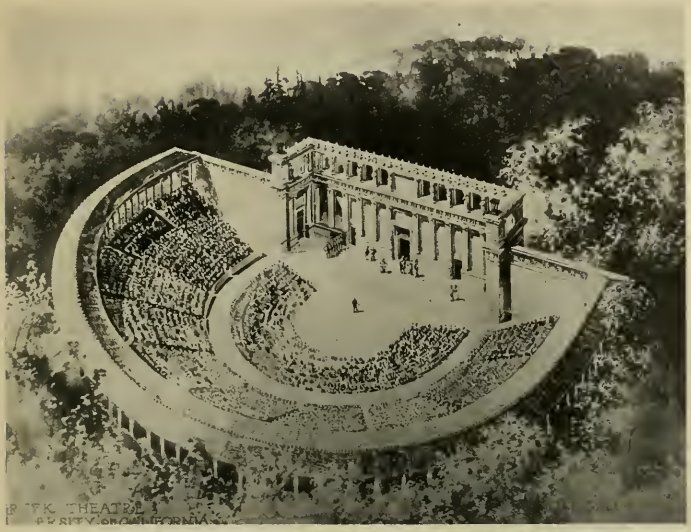
HEARST MEMORIAL MINING BUILDING
UNIVERSITY OF CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT

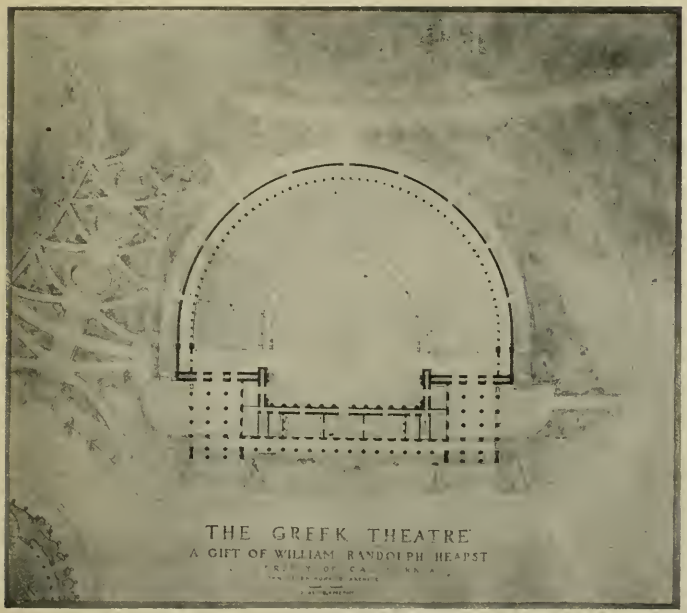
INTERIOR COURT, HEARST MEMORIAL MINING BUILDING, UNIVERSITY OF CALIFORNIA

HEARST MEMORIAL MINING BUILDING, UNIVERSITY OF CALIFORNIA
View from Sather Tower

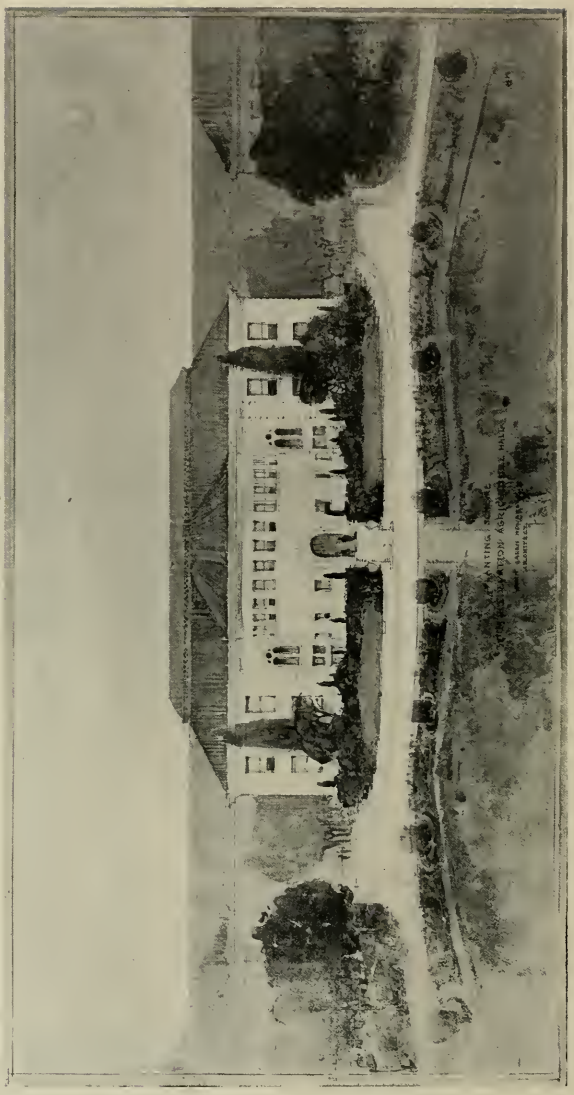
BOALT HALL OF LAW, UNIVERSITY OF CALIFORNIA

READING ROOM, BOALT HALL OF LAW
UNIVERSITY OF CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT





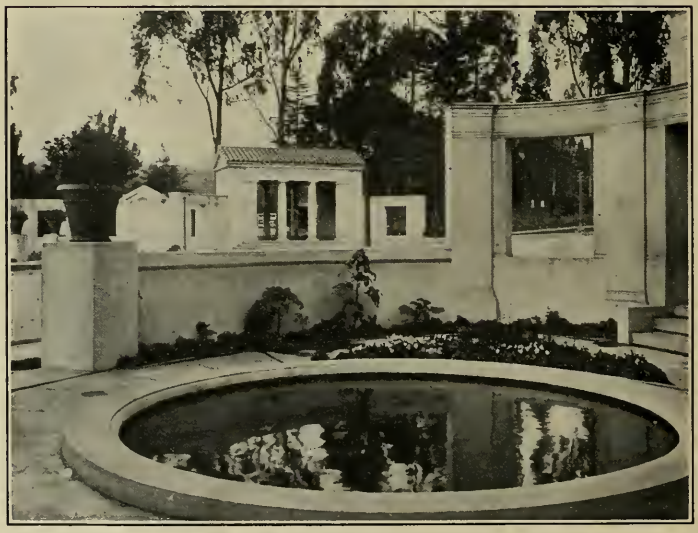
THE GREEK THEATRE, UNIVERSITY OF CALIFORNIA
Perspective and Plan of Completed Building *John Galen Howard, Architect*



AGRICULTURE HALL, UNIVERSITY OF CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT

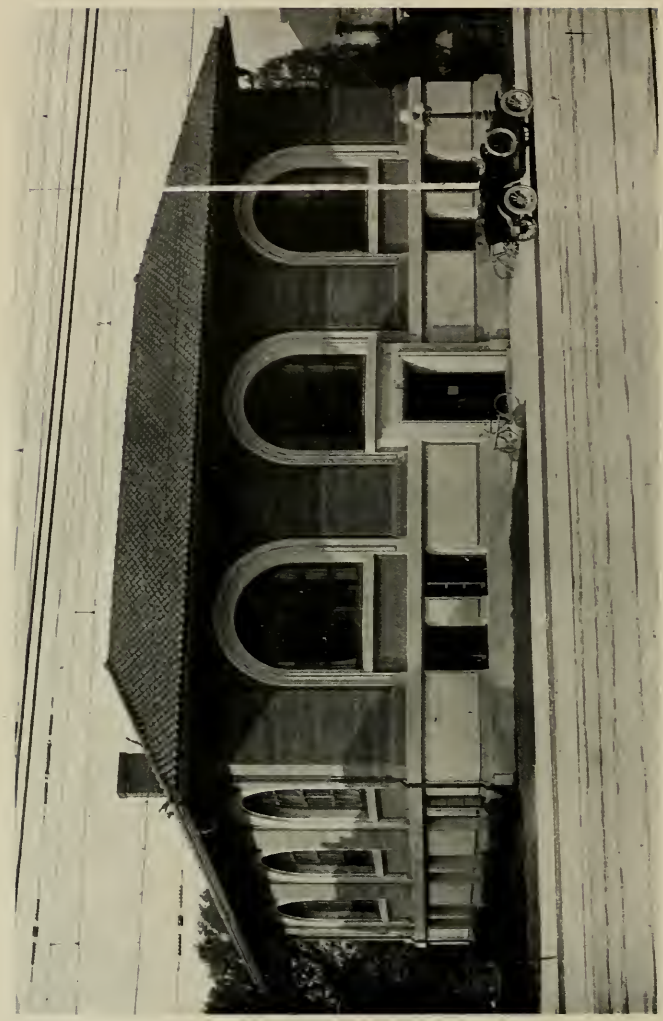
MITCHELL MONUMENT, UNIVERSITY OF CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT

TEVIS MEMORIAL, CYPRESS LAWN CEMETERY
John Galen Howard, Architect

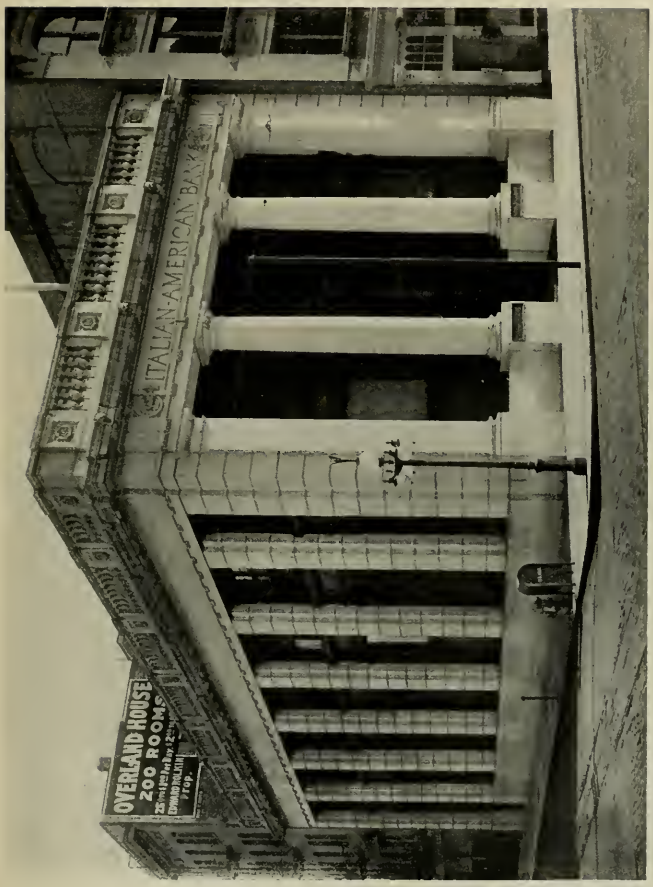


LOGGIA AND GARDEN, MAIN ENTRANCE TO ST. FRANCIS WOOD
John Galen Howard, Architect

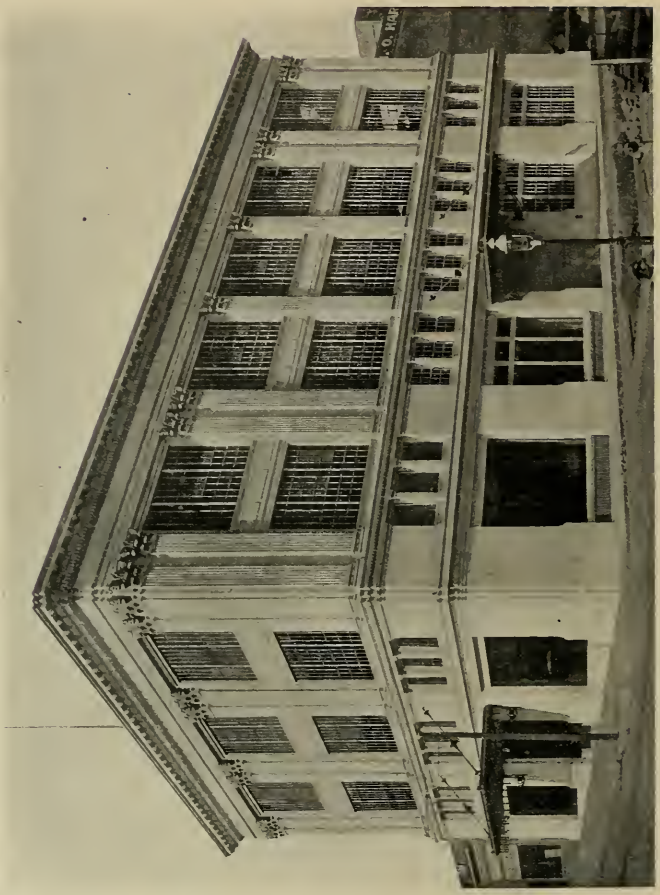
ADAM GRANT BUILDING, SAN FRANCISCO, CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT



PUBLIC LIBRARY, BERKELEY, CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT



ITALIAN-AMERICAN BANK, SAN FRANCISCO
JOHN GALEN HOWARD, ARCHITECT



PIERCE-ARROW BUILDING, SAN FRANCISCO
JOHN GALEN HOWARD, ARCHITECT

CONTINENTAL BUILDING, SAN FRANCISCO, CALIFORNIA
John Galen Howard, Architect

SALES ROOM IN PIERCE-ARROW BUILDING, SAN FRANCISCO, CALIFORNIA
John Galen Howard, Architect

Golden Gate Cement used

BERKELEY NATIONAL BANK BUILDING, BERKELEY, CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT

EUCLID APARTMENTS, BERKELEY, CALIFORNIA
John Galen Howard, Architect

In the placing of the first building on its plot, according to the revised Bénard plan, difficulties of grading developed new and unforeseen problems and it became evident that some way would have to be devised by which the natural contours could be kept more nearly undisturbed. Since the original competition, as well as the subsequent studies, had all been along the line of purely formal architecture, it will be seen that radical departures were needed and that the project had to be studied "de nouveau." One other reason for change has been a response to the fact that any university is a living, moving and growing organism; that its development is impossible of foretelling and that expansions of departments here, shrinkages there, constantly dictate modifications as long as the plan remains in a plastic state.

Mr. Howard's first task for the University was the Hearst Memorial Mining Building, for which the sketches and earlier drawings had been made in New York. In more or less steady succession there have come into being, of the permanent buildings the Greek Theatre, the Power Plant, California Hall, the University Library, Boalt Hall of Law, the Sather Gate, Agriculture Hall and the Jane K. Sather Tower—which is now nearing completion. Besides these permanent buildings there have been erected some dozen or more "temporary" buildings to house in some make-shift fashion the rapidly growing classes of many of the departments. Of the Library, largest of the University Group, it is worth mention that the main reading room—exceeding in size all others in America except that of the New York Public Library—is often so over-crowded with readers that plans for the Library extensions must provide for additional reading space, opening from the already vast main room.

STAIR HALL IN MR. HOWARD'S RESIDENCE
BERKELEY, CALIFORNIA

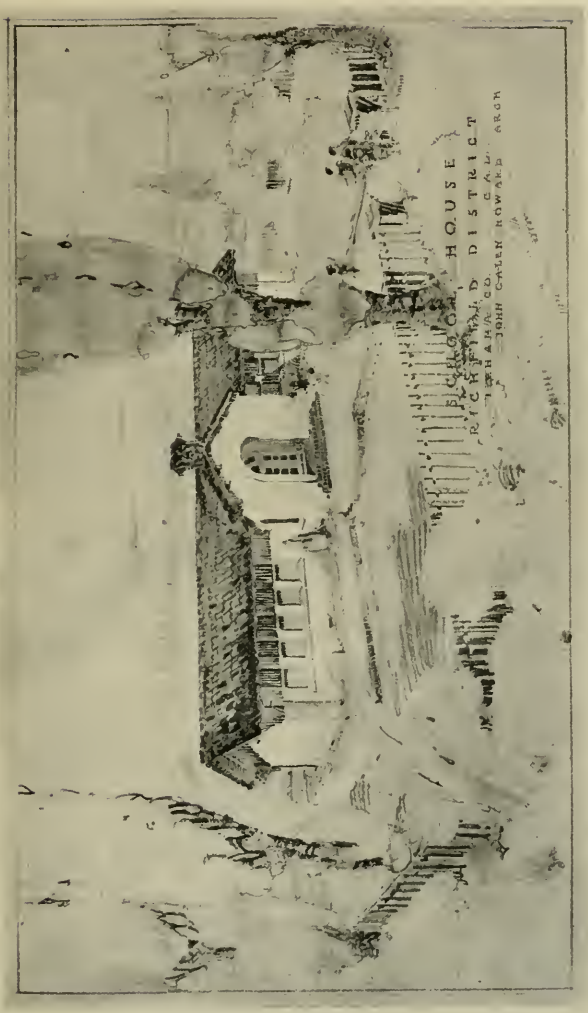
COURT OF MR. HOWARD'S RESIDENCE
BERKELEY, CALIFORNIA

MR. HOWARD'S STUDY

In general practice, Mr. Howard has ranged broadly and has carried out monumental, commercial, domestic and garden work; he has also been entrusted with large undertakings in association with others.

His monumental work is doubtless best shown by the beautiful memorial of the Tevis family in Cypress Lawn Cemetery, San Francisco. The design is composed of a large, somewhat elevated circular niche flanked by exedrae. All of the lines, both in plan and elevation, are subtle curves of great beauty, execution of which was the despair of the workmen. For this memorial Herbert Adams executed three sculptured figures, the central of which, a bronze, is the Angel of the Resurrection, and poises lightly, hands outstretched, above the burial plot. Following the top outlines of the exedrae is a beautifully lettered scriptural text. A word in passing is to be said, also, of the simple but satisfying monumental drinking fountain which was erected in Berkeley by the class of 1907 as memorial to John Mitchell, who was armorer to the student cadets of the University.

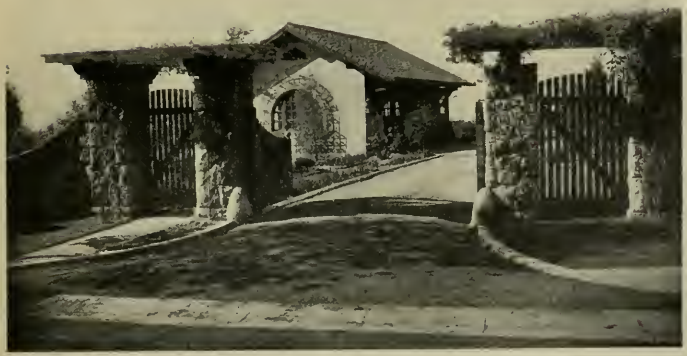
Of a semi-monumental character are the gates and entrances to several land subdivisions in Alameda County, such as those at Clarement, Claremont Court, and Northbrae; and more particularly the comprehensive scheme of entrances, fountains, shelters and minor architectural accessories at St. Francis' Wood in San Francisco. Much is to be said for the restraint and propriety of the architecture of this work at St. Francis' Wood. In its form and detail it seems peculiarly suitable for execution in plaster, for its placing in the broad outdoors against a background of eucalyptus trees and to be, itself in turn, the foil for great floral masses of vivid color.



SKETCH OF A SCHOOL HOUSE FOR THE RICHFIELD DISTRICT, CALIFORNIA JOHN GALEN HOWARD, ARCHITECT

COURT AND LIVING ROOM, RESIDENCE OF DUNCAN McDUFFIE, ESQ.,
Berkeley, California
John Galen Howard, Architect

RESIDENCE OF DUNCAN McDUFFIE, ESQ., BERKELEY, CALIFORNIA
John Galen Howard, Architect



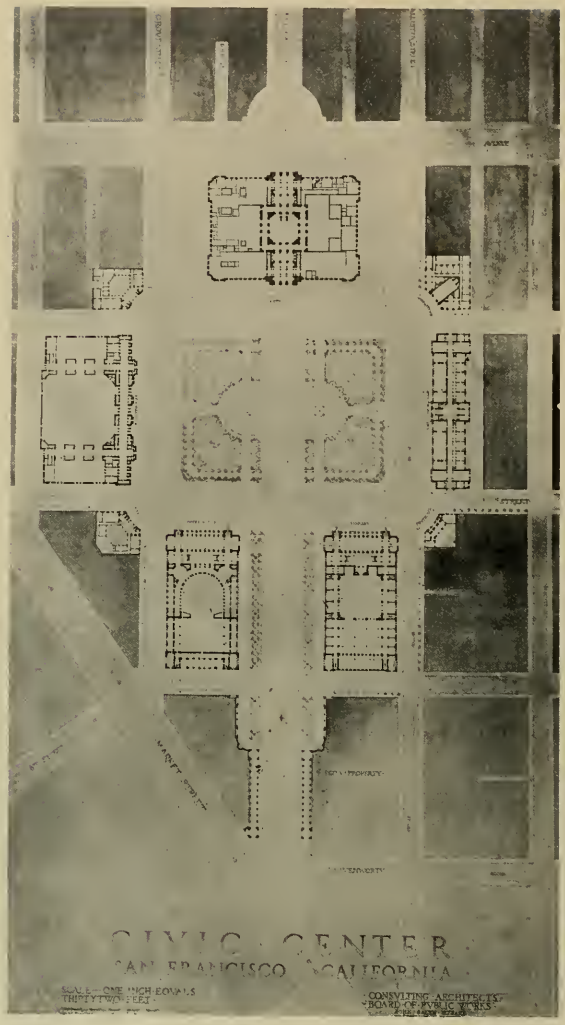
ENTRANCE GATES AND GARAGE OF DUNCAN McDUFFIE, ESQ., BERKELEY, CALIFORNIA
John Galen Howard, Architect

BARN AND PUMP HOUSE OF DUNCAN McDUFFIE, ESQ., BERKELEY, CALIFORNIA
John Galen Howard, Architect

RESIDENCE OF WARREN GREGORY, ESQ., BERKELEY, CALIFORNIA
John Galen Howard, Architect

MUSIC ROOM IN RESIDENCE OF THE MISSES SHEPARD, BERKELEY, CALIFORNIA
John Galen Howard, Architect

GUEST ROOM IN A RESIDENCE IN BERKELEY, CALIFORNIA
John Galen Howard, Architect



PLAN OF THE SAN FRANCISCO CIVIC CENTER

Consulting Architects Board of Public Works { *JOHN GALEN HOWARD* / *FREDERICK H. MEYER* / *JOHN REID, JR.*

AEROPLANE VIEW OF SAN FRANCISCO CIVIC CENTER

Consulting Architects Board of Public Works } *JOHN GALEN HOWARD, FREDERICK H. MEYER, JOHN REID, JR.*

EXPOSITION AUDITORIUM, CIVIC CENTER, SAN FRANCISCO, CALIFORNIA

Consulting Architects Board of Public Works { *JOHN GALEN HOWARD* / *FREDERICK H. MEYER* / *JOHN REID, JR.*

Stone Work by Raymond Granite Company, San Francisco

Golden Gate Cement used

MAIN ENTRANCE, EMERSON SCHOOL, OAKLAND, CALIFORNIA
JOHN J. DONOVAN, SUPERVISING ARCHITECT
JOHN GALEN HOWARD, ASSOCIATE ARCHITECT

PATIO IN EMERSON SCHOOL, OAKLAND, CALIFORNIA
John J. Donovan, Supervising Architect
John Galen Howard, Associate Architect

Several of the business buildings illustrated date from the period following the great San Francisco fire after Mr. Howard had formed a partnership with John D. Galloway, under the firm name of Howard & Galloway, Architects and Engineers. Arthur H. Markwart and the writer being junior members of the firm. Some of the works of this firm were the Italian-American Bank, the Security and Adam Grant Buildings in San Francisco, the Berkeley National Bank and the Bank of Santa Rosa. Among the buildings carried out by Mr. Howard in his separate practice the Empress Theatre, the Third Street Annex of the Spreckels Building, and the Pierce-Arrow Building are all recent; the First National Bank and Carnegie Library, both of Berkeley, date from before the fire.

One of the most interesting of his works is the new Emerson School in Oakland, done in collaboration with J. J. Donovan. This plan is one of double courtyards separated by an auditorium, and surrounded on their other sides by class and administration rooms. It is a plastered exterior with brick trimmings and Spanish tile roof. There is associated with a wrought iron railing for the kindergarten of this school an amusing story of its design. Mr. Howard being asked by an assistant what character should be given to the iron work, answered, "Oh, make it as simple as A. B. C!" He was taken at his word and the panels of the railing are instructively composed of the alphabet and arabic numerals.

Among the most successful of Mr. Howard's domestic buildings mention may be made of the Euclid Apartments at the corner of Hearst and Euclid avenues, Berkeley. Here enough color has been used in the cornice to make

one wish there had been more, and to bring up the query of why we have all seemed to hesitate at the use of strong color in buildings until Jules Guerin came to devise the color scheme for the Exposition. Some other houses erected in Berkeley by Mr. Howard are a group of three, crowning one of the lower hills. The first was the one he planned for himself * and which was designed from day to day on the job. The only drawing made was a plan of the lot and the foundation; after this the owner, on each morning's visit, laid out enough work to keep the carpenters busy for the day. Workmen, who at first found themselves at sea without drawings, soon caught the spirit and became interested and eager to see what would follow. The Sprague and Miller houses complete this individualized but harmonious group. The several buildings of the Duncan McDuffie place also should be mentioned among his domestic works.

Mr. Howard's association with others has been extensive. That nearest us, in point of time and place, is the service rendered by him to the city of San Francisco as a member, together with Frederick H. Meyer and John Reid, Jr., of the Board of Consulting Architects. Schools, firehouses and similar works have been carried out by them, jointly, but the monument equally shared by the Administration, the Architectural Board and a farseeing citizenship will be the design and achievement of a Civic Center and Municipal Auditorium, second to none in the land. The Board also acts in an advisory way with the architects of the other Civic Center buildings.

Mr. Howard, before coming to California, was a leading member of the Board of Architects of the Pan-American Exposition at Buffalo, where he designed and built the dominant feature of the composition—the Electric Tower. He again found himself a guiding spirit in exposition design, in 1906, when the firm of Howard & Galloway were architects in chief of the Alaska-Yukon Pacific Exposition. In that instance the earlier general planning was done in collaboration with Olmsted Brothers. Later, the preparation of architectural plans, the facade sketches, all construction of the main exposition palaces, and the general supervision of all State and secondary building designs were entrusted to Mr. Howard's firm. In the development of the facades of the major buildings local architects were associated. At Seattle there were also three buildings, all the work of Howard & Galloway, which were destined for permanent use by the University of Washington after the close of the Fair. These are now the Auditorium, Chemistry Building (during the Exposition period the Art Gallery), and the Engineering Building.

It is the maturity of his creative power that Mr. Howard has brought and given to California his home by adoption. New York and thereabout is rich in his earlier works. Almost without exception they were brilliant, swift-flashing inspirations of the enthusiast returned from Paris fresh from a three years' quickening contact with Victor Laloux. Already Richardson had taught vigor, and McKim thoroughness, devotion, and fine feeling; so his designs were expressions of vivid personality, of vital young manhood, of a will to do the high and worthy thing. It was in the time of the competitions for the New York Library, the Yacht Club, and of the just completed Hotel Renaissance that the writer, then a student, came to wonder at the power which the high Gods had put into the hands of this young architect, whose name, indexed often in the magazines, meant expectation and fulfillment. Long before he was to me more than a name, the photogravure plate of his exquisite facade for the New York Yacht Club, representing him, hung just over my drawing table; in the years since then I have come to know something of the man. Instead of that voiceless yet speaking facade, studied in college days,

*Described in "Indoors and Out" in February, 1907.

there has been the closer touch in practice and teaching—and on my own part, the unformulated relation of subconscious pupil.

I would say that the distinctive quality of his later architecture is its catholicity. The fault of his earlier works, if fault they had, (though it was the trend of the time, rather than the bent of the man) was that they sometimes found their expression through a too strongly nationalized French type of architecture; these newer things are not French—not Italian, nor Spanish, nor English —nor even American; have they not a quality of universality that is abreast of our age? Perhaps here is added evidence that national demarcations are being wiped out in modern architecture, as they most surely have been in the sciences and, to a large extent, in the other arts.

It is unfair to summarize Mr. Howard's contribution with only this—the visible—result of his service. If these buildings might have been successfully done by other equally trained men, there remains one creation peculiarly his; namely, the School of Architecture of the University of California.

Twelve years ago when he came to the Pacific Coast, there were here no facilities for comprehensive architectural education. A few disjointed courses in the University gave related subjects, but the basic study, design, was lacking. From the outset, the architectural course had to be built up; it began with a faculty of one and a student body of eleven. It has grown to a faculty of seven; it registers about two hundred and fifty students in at least one course in architecture and of these, eighty-two are registered in the major course in design. What means much for the raising of architectural standards on the Coast is that a growing and loyal alumni body is now behind the school, creditably showing by their performances that the work is worth while. Several alumni are teaching, one of whom heads the Architectural Department of a large State university. The school's work is partly paralleled by excellent ateliers of the Society of Beaux-Arts Architects, these two educational forces being helpful to one another.

It is not a measurable quantity, this leavening influence of architectural education in a community. Certainly it reaches beyond the actual student body. Lectures, primarily intended for the students, receive visitors; exhibitions are arranged, publicly announced and largely attended. These exhibitions are not only of students' work, but they are varied to include such diverse things as etchings, lithographs, posters, Japanese prints and oriental rugs.

It is to this phase of Mr. Howard's work, the organization of the school, that a group of the younger architects are most indebted. He has made technical training possible here. He has helped broaden the outlook and open up new opportunities; and, when such a new field is opened one realizes that there have been pioneers coming to California even decades after the days of forty-nine.

MR. HOWARD'S SIGNATURE

Why Be An Architect*

By CARL F. GOULD

WE wonder sometimes after we have had one of our unsatisfactory adventures with a client whose thick hide we have been unable to puncture, whither have flown our early aspirations, our youthful high-mindedness, our desire to better the architectural world. We unconsciously ask ourselves at such moments, whether the materializing of our dreams does in any way correspond to the dreams themselves; whether we have not been led by "will-o'-the-wisp" and have been following something that leads nowhere?

In the days of our early training we had been brought in contact with the great architectural periods of the past; we were led into the cool atmosphere of the Egyptian and Grecian life and art; we were transferred to the great empire of Rome, and led around its forum, in its palaces, and we thoroughly believed that it only needed our combined action, our master enthusiasm to reproduce these epochs and we were certain that they were going to come in our lifetime.

We were led through the great periods when the united religious enthusiasms conspired together in the construction of those altogether most wonderful cathedrals of France, and then we jumped into the sunny period when the classic revival gripped the world and gave birth to the French chateaux. And on we were led through the varied and interesting expression of the classic revival of the kings of France and England with their great and glorious gardens and estates of the nobles into our colonial refinements; and there we seemed to suddenly stop.

The world then becomes a practical evil, our architecture seems to offer no inspiration; we were through then for the time with enthusiasm. We enter the period of individualism started by our great Richardson, and we come marching on to the present day when every man seems to be aiming in his own particular and peculiar direction and no longer do we seem to have the great men to follow. Now, what does it all mean? Where are we going? What will be the next type of expression? Where is the trend?

We return once more to the immediate present and the feeling of resentment that has been left by our client. We have labored over his particular building, spent night working for a satisfactory and a convenient arrangement in plan, we have gone through hundreds of plates in our fondest library books; we finally believe that we have obtained the best possible solution.

We have discussed at length all the most advantageous methods of construction with our engineer: we have gone over with our draughtsmen their drawings, day after day, and restudied them even after they were drawn on tracing cloth to ink; we have carefully described our building to the minutest detail in our specifications and now we have a client on our hands who only gives us adverse criticism. A wife's uncle has criticised the mantel detail; the contractor has failed to figure accurately a partition; a desk does not fit; a gas heater fails to work; a spot occurs in the ceiling from defective plumbing; the architect is immediately blamed for it all and all the conscientious care and thought that has otherwise gone to make the building a success is utterly ignored by our fond client.

We are in despair. Again, and perhaps still again, occurs the greatest of all difficulties—the cost of our client's building has gone beyond the original estimate. Immediately word goes out to his friends and his friends' friends, that the architect is a visionary; that he is unbusinesslike;

*Paper read at annual convention of Architectural League of the Pacific Coast, Seattle, Wash.

that he is incapable of handling a financial proposition. His friends and his friends' friends subsequently build. They go to a contractor who charges them not one solitary cent for the cost of preparing plans, the extras are absorbed and the contractor becomes the hero—at least for the time being. The owner draws up his own plans and any contractor will figure from them.

Once more, where are our dreams? What has become of the profession of architecture? Will we have to wait for the public to learn its lesson, to find that the buildings so designed, so constructed under the supervision of the contractor, is of an ephemeral nature; that the design is only of momentary value; that the plan is not serviceable except for the most immediate uses; that the construction and materials are of the poorest quality and become shabby within a short period of time?

The purpose of an architect, as we know it, is to maintain the standard of design and construction of buildings; to see that they are planned to serve the greatest economical and practical function; to see that the best and cheapest building materials are used, and that they are put in place in the best and most efficient way; to see that above all, when the building is finished, it expresses in its design its charactr and functions; that it will become a thing of beauty without which it has no lasting quality.

With this big purpose, can it be supposed that the architect is no longer needed? If we look at our building records we find that only a small percentage (we estimated at one time 17 per cent) of the work done in our city was done through architects' offices. We certainly, as a profession, cannot exist without the public. The public can, as it is showing us, exist without us. It seems most improbable that if the above is our function that the public will, in the long, continue to build its structures in an interior way when there is one proper, ordinary and sane method of procedure—the employment of an architect.

This has been true throughout the ages and it will continue to be true. The architect serves a definite function; he is needed by the public, and they will insist upon his serving them. Our thick-skinned client (we will have to admit at this point that his epidermis is not always of this nature; that we have had most delightful experiences with the species and draw from it some of our best friends).

But we are certainly misunderstood, generally speaking, by the public and this misunderstanding can only, it seems, be properly overcome by going before the public and stating our case; telling it what architecture is; what the functions of the architect are, and how he serves the public in an economical way; that he does not exist merely to put frosting on a wedding cake, but that his duties are interwoven in every detail of arrangement, plan and economy of a structure. Let us each go out and not always blame the public or our clients until we have gone before them and explained our position more fully, taking advantage of every opportunity through the press, through our schools, through our universities, and through our popular magazines.

The profession of an architect is one that serves in a constructive capacity and touches our people at innumerable vital points. We must assume our responsibilities and put our proposition to them in an impelling way; we must systematize our methods of getting our services so that the public understands them. We shall, without question, succeed in accomplishing this and our client will then become a more appreciative being and the difficulties which we have encountered will be far easier to overcome because we will have his confidence at the start, and although we may make mistakes occasionally as individuals, he will not blame the entire profession.

The Architect and the Client*

A Banker Speaks on the Subject

NOTWITHSTANDING the fact that I live close to two architects and I have one in my family, I am perfectly amicably disposed toward the profession, and may truly say that I always have dwelt in good relations with its members. I may say that I expect to do so until such time as I shall build something of my own.

While I say this with a frivolous revelry and abandon, I note that you assume that in it there lies concealed a subtle something, about which I am going to trespass on your good nature and amiability.

One is not often given a chance to talk to architects and tell them, as a crowd, just what one thinks of them. I am somewhat peculiarly situated in regard to this. I have worked in an architect's office and have studied architecture and building and am one of those so-called business men who are supposed not to know the aims, ambitions, and hopes of the men of your profession, and am also one of that body of men who continually offend by refusing to recognize the ethics of your profession.

Perhaps it was fortunate for me that I was brought up in the atmosphere which was always redolent of the carnage of battle between the artistic temperament and the commercial temperament, and I am quite sure that I am not mistaken when I say that there is a great deal to be said on both sides of this question, and that there is a great deal that has been left unsaid by the architects, which in duty to themselves and to the public requires to be said.

You may have noted a remarkable fact in regard to the average American business man in that there is no question which he feels quite as unable to master easily as the question regarding art or architecture. This feeling is largely due, of course, to unfamiliarity with the subject as well as to a contempt for its mastery—a feeling which has been engendered by an exclusiveness of aim and attainment on the part of those who practice it. It seems to me that it is possible to bring about a more complete understanding of your work and its necessities by the adoption of a few simple principles, one of the first of which is that the public be made to understand the architect's point of view.

We must remember that all professions dealing in imaginative qualities of work have had, from time immemorial, difficulties of understanding as between principles and clients, and architecture has this difficulty because, if the client had these qualities, he need only employ a carpenter or builder.

Perhaps you may remember how indignant was Michael Angelo when he overhead the Pope and one of his advisers criticising his work and methods, and how his indignation got the better of him and he upset the paint on their heads from his scaffold.

Perhaps we can go further back than that, even to the remote ages, and remember the sadness of the ancient Chinese painter who, overwhelmed by continuous criticisms and misunderstandings retired into the painting which he had made in order that he might retain his peace and happiness.

All our earlier artists and architects suffered from the universal lack of knowledge of art and from an improper understanding of its necessities; but, in spite of that, and, I might say, by favor of that, they were able to produce lasting things.

Richardson suffered from this as much if not more than than any architect, and I could cite you numerous cases of apparent disregard of the feelings, opinions, or intelligence of architects, artists, and sculptors.

*Abstract of an address delivered by Mr. Oliver La Farge to the members of the Architectural League of the Pacific Coast at Seattle, Washington.

Almost universally, may it be pointed out that an understanding would have been easily possible provided the professional man had been willing to unbend and become a teacher to his client.

In all cases you will find that the impatience of the so-called practical man of affairs with the imaginative qualities of architects is due in part to three or four things:

First. Lack of knowledge of the cost of drawing.

Second. Lack of explicit determination of what the client is paying for.

Third. Lack of imagination—that is, lack of understanding—of what the architect's function really is.

Fourth. Lack of evidence of commercial return on good design as well as planning.

Now as to the first: It is a problem how to get this into the lay mind, but I assure you it can be done if the architect himself keeps a cost account of his draughting as he should; yet there are many architects who do not keep such a cost account and therefore cannot explain to the client in details of dollars and cents and hours and minutes. If they keep such a system, there is nothing that will interest the commercial client more than an exposition of it.

Now as to the second: A definite method of charging is professionally correct and should be adhered to, but the public usually misunderstands what is meant by *supervision,* and wherever you find a client you will very likely find him confident that he is not getting the supervision to which he is entitled. I believe that a complete understanding on this point before proceeding saves many difficulties and much expense to architects.

Now the last two difficulties, which are really due to a lack of education, can be remedied (and I believe they have been somewhat remedied), first, by keeping to the standard of your profession and demanding recognition of your standards, and also by a constant exposition of the work of the architect, what he has done for the community and what he can do, and what he supplies that the other man lacks.

It has seemed to me that a practical book, on the plan of Mr. Richard Hurd's book on real estate values, would be of great value not only to architects but to the public. I presume many architects are familiar with that book. It gives the history of city growth, and the land, building and rental values of many cities which, of course, are closely related to the question of proper planning. It gives many examples in photographs of rental values sacrificed by architectural blunders in planning, and on the whole, I think there has been no book written on that subject as good as this one.

My own business is mortgage banking; that is, savings-deposits invested in city mortgages. To us, during periods such as we have had in the last few years, the only real basis of appraisal of real estate for mortgage is the rental basis, because of the lack of sales of real estate. The rental basis of a loan depends in part upon the good planning of the building, and in part upon its location, but the major portion depends upon good planning. This depends upon the architect. So, you may see that after all we are closely allied—if you do good work we can do good work—and just so much as a savings bank is able to invest its funds wisely and safely in a community, just so much better and richer is that community; it is being constructed by its own people, and is just so much more able to employ good architects.

I believe that architects, as a rule, are the best professional men of any community. I have always found them alert, filled with civic pride, and very human, and the most delightful men as friends. I have usually found them controlled by two very strong motives; a constant wish to do honor and justice to their profession, and a desire to please their clients, of course not counting

the anxiety we all have to get the job. The control by associations is a good thing, but I beg you to remember that your client cares nothing for rules and regulations, and you must educate him to a belief in your capabilities, and not present him with a printed slip of what the Institute decrees professionally. You can do this now, where you could not do it twenty years ago.

There are occasional lapses by the public but the emphatic expression of outrage by the people of the world at the recent destruction of the architectural monuments in France and Belgium must convince you that the people are generally assured of the value of good architectural work.

My conclusion is that the successful architect is the one who can handle the public without offense to its sensibilities, and still cling to the high ideals of his profession.

* * *

A Plea for the Preservation of the Present Architectural Beauty of the Ferry Building

Editor The Architect and Engineer of California:—The subject of the traffic congestion at the foot of Market street, San Francisco, at the Ferry Building, which is before the people of San Francisco at this time, is of great importance to both the present and the future generation.

In surface planning, as suggested in the plans printed in the November Architect and Engineer, we have no advantages over what is already in general use today. And besides, if these plans are to be followed, I fail to see where we would be adding anything to the appearance of the present structure; on the other hand, we would simply destroy what architectural beauty there is now.

The widening of Market street at the ferry would be a good idea, as it would give a freedom to the whole plan, which is now in a cramped position. And if we are to thus consider the beauty of the situation from an architectural viewpoint, I would suggest that this be carried out. The Ferry building is a gem within our great city, and it should not be disfigured by anything so unsightly as suggested in your November number.

Let us build simple, if we must, but in harmony, and not carry out something that we know will be in the present and the future an eye sore to our conceptions. The only true solution of this problem is the subway plan. Here we have the advantages of carrying out all that can be desired, both architecturally and in the matter of solving the traffic congestion problem.

We have come to love our Ferry building with an immortal love, and for the sake of relieving the traffic congestion, let us not lessen this immortal love, not while we have other means to preserve its beauty—other than surface planning.

The planning of underground conveyance could be carried out more extensively than we perhaps realize. We do not want to build and tear down. Let us build so we may add without tearing down.

I suggest if we must use the Embarcadero for ornamental purposes, let us erect something that will be in keeping with the general appearance and design of the present surroundings.

Here in the center of the Embarcadero we may erect a beautiful fountain symbolizing our beloved San Francisco, surrounded by her courtiers who have brought fame to her throughout the world. Let this fame develop into the realization of our true love for her; and then we shall have justified the means to an end.

GUY QUINTIN DOANE.

1827½ Addison street, Berkeley, California.

The Human Side of the Architect

JAMES STEPHEN, in the Pacific Builder and Engineer*

MANY a good fellow is wrapped up in a shell of formal dignity which, if pierced, would disclose a kindred spirit.

The architect, with his artistic temperament and high ideals, on a close diagnosis, we fear, would prove to be quite human.

In our day we are much given to organizing societies and associations with high-sounding names which, after learning to enunciate clearly, we take a certain pleasure in repeating with a glibness acquired by long practice.

A few days ago a gentleman called at my office and introduced himself somewhat in this wise: "I am the president of the Rainier Valley Sunday School Association, an auxiliary of the King County Sunday School Association," etc. Of course I was impressed by this tremendous title and was about ready to kow-tow when I succeeded in getting under his epidermis only to find him just a man and a very good fellow.

It so happens by the grace of council appointment that I hold the office of president of the Washington State Chapter of the American Institute of Architects, a truly impressive title and one that compels our respect, so awe-inspiring is at that we involuntarily begin an inventory of our person to see if our necktie has sagged or a vagrant button slipped its moorings.

Naturally, we assume a certain formal attitude and demeanor at the meetings and functions of our high-sounding, long-named association. At these gatherings we have listened in times past with more or less pleasure, not to mention patience, to long, carefully prepared papers full of glowing enthusiasm, lofty ideals and sparkling with well chosen gems of thought, a seeming effort to reduce to an essence the combined wisdom of the dictionary and the encyclopedia.

It is no far cry to imagine one of these writers on the morning following his masterly peroration engaged in a futile effort to convince his client that the commercial building that he is planning should stand on an obviously substantial base, only to have his suggestions brushed aside by this business juggernaut who demands that all supports for upper stories, be they one or ten, be kept well back of the window plane and covered with mirrors to complete the illusion, leaving the architect's dream floating on a sea of plate glass.

Can you wonder that the lofty idealism, shocked, suppressed and buffeted by a cruel and unappreciative world, finds in his association a haven of refuge wherein and in the presence of kindred spirits he may unburden his soul of its longings?

Are we not inclined to take ourselves too seriously; at least to have the other fellow believe we are what we are not, and even try to convince ourselves that the clay of which we are made is a superior kind of mud and not the ordinary blue stuff with, it may be, a streak of yellow?

It is quite possible that in our efforts to preserve the dignity of the profession that we assume too much dignity in our own persons.

How often it happens that we do not really discover the man within his shell of reserve until some crisis or emergency shocks him into an exposure of his real self, which generally discloses finer traits of character than we had given him credit for.

At a recent function we were regaled with a story of George B. Post, wherein he was discovered in a fluently profane discussion with a fractious

*President Washington State Chapter American Institute of Architects, Seattle.

Irishman digging post holes, a momentary uncovering of the human side of this great man (not the Irishman).

Among children the favorite diversion is playing make-believe, and as they grow up into man and womanhood they still play the game but give it another name—bluffing, or grown up make-believe; and who among us does not put up the bluff?

Holding the office of president of this august body puts one under constant fear of doing or not doing something which might lower the dignity of the office. Being a humble member of this chapter is a wonderful deterrent in keeping us out of questionable situations, hence the awful check exerted on the natural exuberance of the president.

The writer is fond of a picture show, but owing to his exalted position and fearing a lapse of dignity, looks carefully up and down the street to see if he is observed before entering one. On a recent occasion, after making the usual reconnaissance and finding the coast apparently clear, we got out the exact admission fee and made a dive for the entrance of a Second-avenue picture house and sat down in an obscure seat, feeling that we had not been discovered, and then the lights were turned up. Much to my amazement, and to his, I discovered in the man sitting next to me one of the most dignified members of our chapter, who rather apologetically began a feeble attempt to justify his presence by an assumption of looking up the angle of projection, while I must confess to a similar effort, giving as my reason a study of acoustics. Of course he knew, and I knew, and he knew that I knew that he knew that we had both dropped in with more or less deliberation just to see the pictures. Why didn't we say so? Why not be human?

[We had the same experience the other day when we dropped into a Market street "movie" and found seated close by a usually very busy San Francisco architect, who, from outward appearances and general air of aristocracy, would not deign be seen at anything less expensive than a grand opera. And do you know what excuse he offered? Had been working on a problem all morning. Was nervous and no appetite, so dropped into the picture show during the noon hour for relaxation!

Speaking of architects and the "movies," the writer knows of a San Francisco architect who used to be an almost daily patron of the "cock-tail route" up and down Market street. Now he is a "tee-totaler," and he finds quite as much satisfaction and diversion in visiting the nickelodeons, sprinkled along both sides of Market street, as he used to find patronizing the bar-rooms. This architect starts out about 11 o'clock in the morning and saunters up one side of the street and down the other, stopping at about the same number of movie houses as he used to visit saloons. Inside the theaters you will invariably find him way down front, where he feels safe from observation. After all, there is nothing to be ashamed of in his daily indulgence of the pictures; surely 'tis infinitely better than fighting John Barleycorn!—Ed.]

* * *

Pointers

"Business is a matter to give and get,
And what you get depends on what you give.
Give a knock and you get a knock;
Give a boost and you get a boost;
Give service and you get profit."—Selected.

A New Type of Artificial Swimming Pool*

THE need of artificial swimming pools in our thickly populated districts is coming to be more and more clearly recognized by every one who thinks seriously of the important problem of physical education, and our urban Park Commissioners and Boards of Education must soon enter upon extensive campaigns of swimming pool construction. A great difficulty, however, is that the problem of keeping an artificial swimming pool clean is coming more and more to be thought of as impossible of solution. A very careful study** of thirty-five swimming pools in Connecticut, New York and New Jersey recently made under the direction of the College of Physicians and Surgeons of New York City shows that the great majority even of the carefully conducted pools are more or less filthy. Only one pool out of the thirty-five was shown to be actually clean. In this pool the water was changed only once or twice a week, and continuous filtration was employed at a rate sufficient to turn over, in about forty-eight hours an amount of water equal to the contents of the pool. This same procedure was followed in most of the pools which were studied, the difference being that in this particular pool rigid rules were very scrupulously enforced as to the evacuation of bladder and bowels and as to the washing of the body before entering the pool, and as to spitting in the pool. Such necessary rules can, however, be strictly enforced only when a pool is used by a fairly homogeneous group like the students in a college, and even then there is always a chance of serious pollution. Now, it is no great satisfaction to the prospective user of a public swimming pool to know that the washings from the body of another person are innocuous in nine hundred and ninety-nine cases out of a thousand! Indeed fastidiousness is, in its essence, the instinctive appreciation of the seriousness of the one case in a thousand! An improved system of operation of the public swimming pool is necessary, as any one must realize who considers how the average person hesitates to wash his hands in a basin of used water and how almost unthinkable a second-turn bath is even in the privacy of the family!

Professor W. S. Franklin of Lehigh University has worked out a plan which makes it feasible to install a swimming pool of the largest size and keep it as clean as hourly scrubbing and hourly changes of water can make it; at a cost which is no greater than the cost of operating a pool under the old system, and in a place where the water supply is neither abundant nor cheap. The plan involves three distinct elements as follows:

(a) The installation of a large sand filter alongside of the pool with a capacity sufficient to turn over the water in the pool from twelve to twenty-four times per day depending on the number of persons using the pool. It is well known that very badly polluted river water and even actual sewage can be made drinkable by the use of a sand filter, and water which has been in a swimming pool for an hour or two can be easily and repeatedly purified by a sand filter. It is the common practice at present to install a continuous filter in connection with a swimming pool, and the capacity of this filter is usually sufficient to turn over, in forty-eight hours, a quantity of water equal to the contents of the pool. The suggested installation of a sand filter carries with it the idea of filtering the water at an enormously increased rate.

(b) The use of a lightly framed bulk-head which is pushed slowly from one end of the pool to the other by the inflowing pure water, thus entirely

*The novel features of design and construction which are here described are covered by applications for United States patents.

**See American Physical Education Review, December, 1912.

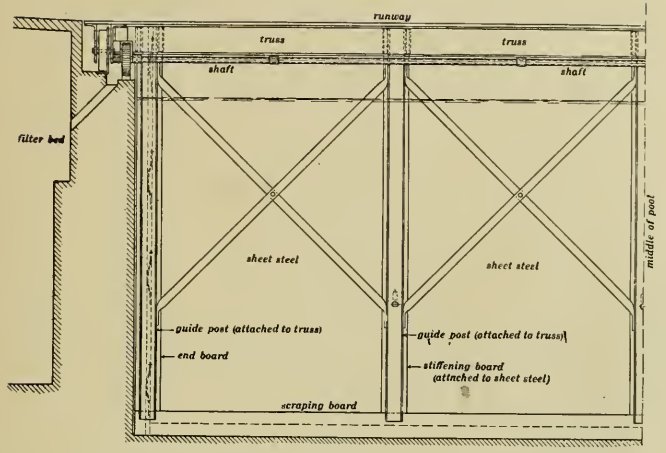

runway
truss
truss
shaft
shaft
filter bed
middle of pool
sheet steel
sheet steel
guide post (attached to truss)
guide post (attached to truss)
end board
stiffening board
(attached to sheet steel)
scraping board

Fig. 1

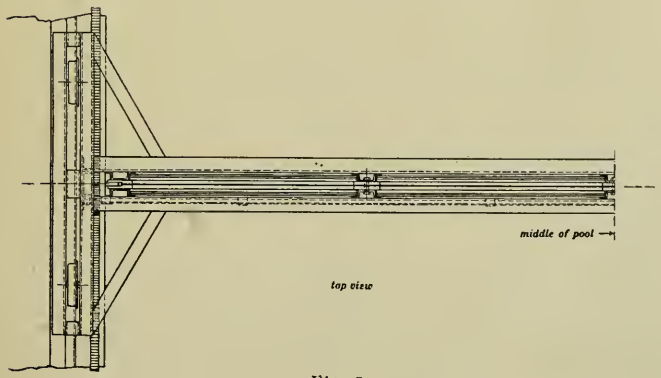

middle of pool
top view

Fig. 2

preventing the mixing of the inflowing pure water with the used water in the pool. The advantage of this moving bulk-head is an enormous increase of efficiency of the sand filter by preventing the mixing of the inflowing pure water with the used water in the pool. In all existing pools the filtered water is allowed to mix with the used water, so that about one-eighth of the old water remains in a pool after a quantity of water equal to three times the contents of the pool has passed through the filter. The moving bulk-head would certainly produce a four-fold increase of efficiency of the filter.

(c) The use of the moving bulk-head for automatically scrubbing the bottom and side walls of the pool as it travels back and forth along the pool. Frequent scrubbing of the sides and bottom of a pool is necessary, and the only method now available is to empty a pool and wash it out by hand. Professor Franklin's plan provides for a slight lowering of the water level in front of the traveling bulk-head so that the bulk-head is pushed along by the inflowing fresh water, and the scraping and rubbing action of the closely fitting bulk-head provides for a thorough scrubbing. When the bulk-head reaches the end of the pool it passes over a number of by-pass channels in one of the side walls of the pool so that the pure water flows around the bulk-head and sweeps across between the bulk-head and the end of the pool, thus eliminating every drop of used water from the pool. At this time the inner face of the bulk-head and the end of the pool can be swabbed by hand. The by-pass channels are provided with light valves which close when the flow of water is reversed thus causing the bulk-head to start on its return travel.

The essential details of the moving bulk-head are shown in Figs. 1 and 2; Fig. 1 is a front view and Fig. 2 is a top view. A light steel truss bridges across the pool and rests upon two two-wheel trucks which run on two rails, one on each side of the pool. Two pinion-racks are placed alongside of the rails, two pinions gear into these racks, and the two pinions are keyed to a shaft which reaches across the pool and is supported by the light steel truss. The steel truss presents a flat surface on top which serves as a narrow runway, and the truss and trucks are strong enough to support any number of persons who may sit or stand upon it or who may climb upon it by means of the ladders which are attached to it. The bulk-head itself is made of a large sheet of galvanized steel with a wooden plank screwed to its lower edge, and this sheet of steel with its attached plank is held in the frame-work of the truss with its entire weight resting on the bottom of the pool. When the board becomes badly worn the sheet of steel can be hoisted out of the frame-work of the truss, and a new board attached to it. The sheet of steel has vertical boards attached to its ends, these boards reach to within about half an inch of the side walls, deep grooves are cut in the edges of these vertical boards, in these grooves are placed two tongues made of three-quarter inch boards, and these tongues are pushed against the side walls by springs. The edges of the bottom and end boards (tongues) give the desired scraping and scrubbing action, and water rushes through between the scraping edge and the polished cement surface wherever there may be failure of actual scraping contact. A tongue of compressed cloth may be set into the scraping edges if necessary.

Satisfactory operation of the moving bulk-head requires the bottom and side walls of the pool to be made accurately plane, and the interior finish of the pool should meet three other important conditions, as follows: (1) The walls and bottom must be smooth so that dirt and algae growth can be cleaned off by scrubbing; (2) The interior finish should be such as to

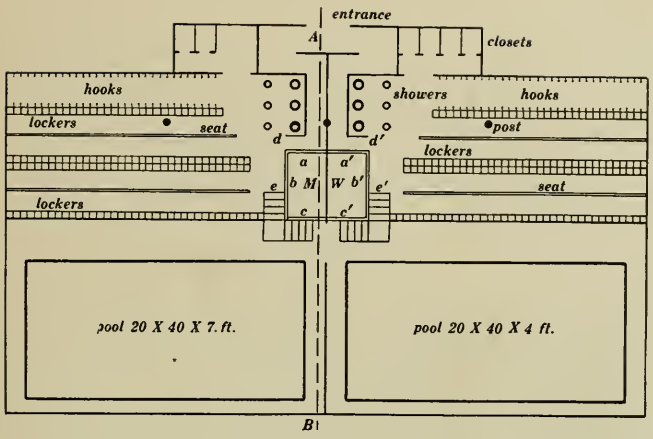


Fig. 3.

show up the cleanness of the water, and (3) The finish of the bottom and sides should be such as to give to a diver a distinct sense of the depth of the water.

Any one who has noticed the smoothness of a well made concrete sidewalk after it has been rubbed down a little by traffic must admit that such a surface would be smooth enough for the interior of a swimming pool. Indeed a concrete walk becomes extremely smooth if the surface cement contains finely crushed limestone which is soft enough to wear down under the action of shoe leather. To bring out strikingly the cleanness or turbidity of the water, the bottom of the pool must present a clearly defined pattern with sharp edges and strong contrasts. To give to a diver a distinct sense of depth the side walls should also present a sharp pattern.

Professor Franklin proposes the following construction of the pool bottom to meet the above requirements. After the bottom of the pool has been laid in rough concrete with or without a water tight layer of asphalt and paper, a checker work of narrow strips of milled slate or molded cement (blackened by mineral pigment) is laid over the bottom, and these narrow strips are wedged up by thin metal wedges to an accurately plane surface on top. As this checker work is laid, the open squares are nearly filled with ordinary cement grouting which is worked to some extent under the narrow strips, when this grouting is hard the squares are filled with a special cement which is known in the trade as "lily white" cement, and the whole is then rubbed down to a smooth surface by a very moderate amount of grinding. The surface cement would be perhaps best made by using finely crushed marble or calcite instead of silica sand.

The side walls of the pool are of concrete molded between vertical slabs of cement on one side and a board frame on the other side, the vertical cement slabs being tied to the concrete by projecting screws. The cement

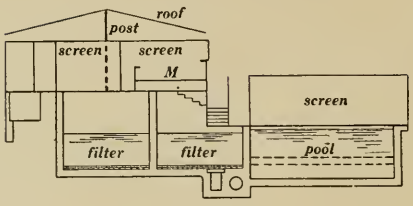


FIG. 4.
Section along *A B* of FIG. 3.

slabs are made as follows: On a smooth cement floor (the finished floor of the pool for example) a sheet of wet paper is stretched, a rectangular frame of one-inch strips is laid flat upon this paper and thin squares of slate or molded black cement are arranged inside of the frame in any desired pattern. A thin coating of white cement is then thrown upon the paper and slate blocks by a broom or air blast, and when this thin layer of cement has hardened slightly so as to hold the slate blocks in position, a layer of cement coming up to the top of the one-inch strips is spread over the whole. Then a sheet of wire gauze or expanded metal is laid on the cement, a second frame of one-inch strips is placed on top of the first, and another layer of cement is spread over the whole and finished sufficiently smooth and flat for the building of another slab on top of it; and so on. When the slabs are hard they are turned with their figured faces upwards and white cement is spread into the flaws to give a smooth surface. The faces are then polished by a moderate amount of grinding. Small metal blocks, tapped for screws, are laid into the backs of the slabs while the slabs are being made, and screws are screwed into these blocks to provide for the tying of the slabs to the molded concrete wall.

Another important feature which is proposed by Professor Franklin is a layout which so far facilitates the work of inspection and attendance as to make it easily possible, in the case of a small natatorium, for a single attendant to look after everything when the natatorium is being used by one sex only, two attendants being employed when the natatorium is being used by both sexes. The layout is shown in Figs. 3 and 4. The middleweight lines in Fig. 3 represent high screens of corrugated steel. The man attendant stands on a platform *M*, which is about two feet higher than the floor of the dressing rooms or locker alleys and five or six feet higher than the platforms which surround the pools; and the platform M is surrounded on three sides by a low counter, *a*, *b* and *c*. The man attendant takes in entrance fees from men and boys at *a* and operates an entrance stile; he serves out towels and soap; he looks over the low splash screen *d* to see the showers in use, he looks into the closets and locker alleys, and looking over *c* he has a view of the whole of both pools. The men and boy patrons present themselves in a nude condition at the counter b to be inspected before receiving bathing suits or before passing down the stairs at *e* to the pools. Similarly a woman inspector stands on the raised platform *W;* and hand wheels are conveniently located so that either inspector can operate all of the valves for controlling the hydraulic arrangements of the pools and filters.

The pools shown in Figs. 3 and 4 have been designed for Sabetha, Kansas, and everything possible has been done to reduce the consumption of water. Each shower consists of a supply pail with a few feet of rubber tubing connected to it, and two showers together constitute a unit; one of the showers having a one-quart supply pail and the other a five-quart pail. The bather removes the one-quart pail from its shelf, fills it with warm water at a hydrant (hydrants are not shown in the figure), places it on its support and soaps himself thoroughly. He then fills the five-quart pail and rinses himself thoroughly. The closets shown in the figure are of the dry type, and odors are to be eliminated by using two small electric fans and a tall ventilating flue for each set of closets. The arrangement shown in Figs. 3 and 4 will cost about $5000 with only 50 lockers installed at first. The floors are to be of cheap wooden construction, and the scraping of the filter beds is to be done from one end.

The pools shown in Figs. 3 and 4 will accommodate a maximum of 30 swimmers and 30 learners, or, reckoning on an average of 45 minutes in the pools for each person with open hours from 10 to 12 A. M., and 2 to 6 and 8 to 10 P. M., a maximum of 640 bathers can be accommodated each day. The filters will turn over the water in both pools in two hours, and with the above schedule the water in the pools will be as fresh and clean at the beginning of each of the three periods as if it were drinking water in well-cleaned glasses, and while in actual use the water will be changed and the sides and bottoms scrubbed once every two hours.

The pools shown in Figs. 3 and 4 contain about 70,000 gallons of water, and the cost of operating them on the old plan with semi-weekly changes of water would be $14 per week *for water alone* at 10 cents per thousand gallons, and the old plan involves the following additional items of expense to keep the pools in condition, namely, interest and depreciation on the usual pump and filter equipment, cost of power for operating the pump, and cost of labor of washing out the pools twice a week. On the other hand, the filter beds in Figs. 3 and 4 together with all hydraulic equipment represent a cost of about $1500 over the cost of the bare pools and dressing rooms, and the cost of operating the filters is $17.10 per week counting interest and depreciation at 10 per cent per year, counting 10 cents per kilowatt-hour for energy to drive pump, counting on filling the pools once every month with new water at 10 cents per thousand gallons, counting $24 every eight weeks at the cost of scraping and reforming the sand filters, and assuming a swimming season of 120 days.

* * *

Requirements for the Admission of Architects to Practice

THE report of the Committee on Legislation, presented to the forty-eighth annual convention of the American Institute of Architects, contains much that seems to be of both general and timely interest.

The subject of licensing architects or admitting them to practice, as the institute prefers to term it, is one that will require study and definite determination within the next two or three years. If the advantages outweigh the objections, as now seems to be the general impression, every possible effort should be made to secure the enactment of laws containing uniform provisions in all states. If, on the other hand, further study and investigation gives conclusive evidence that such a law is in danger of eventually

becoming a check to architecture, it is well that it should be known, in order that proper means can be employed to prevent a spread of an undesirable form of legislation. The committee referred to goes on record as follows:—

> We believe, after careful analysis of laws now in force for the admission of architects to practice, and the reports showing their practical workings, that it can be said, first, that architects should be admitted to practice, and that the states having license laws have proven that the public benefits thereby. We further believe: that if the laws in force are not improved in certain particulars, and if the profession as a body is not for them, and a constant eye kept on their workings, that there are many reasons why they might eventually become a check to architecture and, of course, in that case a hurt to civilization. We believe: that any license law that is not primarily for the good of the public at large is not good for architects, and would be a boomerang to our profession. * * * We believe: that the present laws are deficient in not covering in their definitions of an architect, what an architect is. Most of the present laws define the qualifications of an architect in a way that would lead the public to believe that his principal duties are along structural and sanitary lines. While we know that he should have some knowledge of these matters, they are not by any means the principal qualifications of an architect, and the license laws should describe more fully what the qualifications of a practicing architect are. * * * The architect's most important qualification should be ability in the art of building, and the science of building should be secondary. The architect is not the highest authority on construction or sanitation, but he should be on planning, grouping, design and color. Are not these latter requirements more necessary of possession by architects to help the public toward better architecture than knowledge of trusses and plumbing?

This feeling of the committee, comments the American Architect, can be readily understood, and there is little doubt that the majority of architects would prefer to be known as men proficient in design and color, rather than as men who have expert knowledge of construction and sanitation.

However, laws heretofore enacted designed to regulate the practice of architecture by restricting it to those who have given satisfactory evidence of proper qualifications, have, as far as appear, been based upon the theory of police powers vested in legislatures to enact laws necessary to the protection of life, limb and health. Moreover, where they have been tested their constitutionality has been established by reason of features that were held to be proper means of safeguarding life, limb and health. In other words, it appears that the structural and sanitary features of buildings are, in the eyes of the law, the only ones essential to the physical welfare of the public, and hence constitute the only valid excuse for a license law.

It would be, of course, highly desirable to also regulate and fix artistic standards, if such a thing were possible, but it is not plain just at this time how this could be done. Even if it were possible, such action would not in any sense appear to justify lowering the standards or eliminating present requirements in matters of structural design and sanitation. These features are essential and necessary, and must be provided by someone. If the architect does not qualify and become responsible for them, someone else will, and it would seem as though such a course would tend to detract from or restrict his present position of authority in charge of building operations. There can be no objection to, and there are a great many things in favor of, adding to the present requirements for registration of architects, a more thorough knowledge of planning, design, grouping and color, but it would appear to be fatal to the success and even validity, perhaps, of a registration law to omit or make less rigid the present requirements in matters affecting the health or safety of those occupying or visiting structures designed by architects; and to our minds, such a course would also be unwise as tending to rob an architect of his position of supreme authority in connection with any building operation under his direction. While, as is stated by the committee, an architect can readily

employ engineers to design the structural and sanitary features of buildings, the state has no assurance that he will always do so, and to admit an architect to practice relying upon the probability of his employing others more competent than himself to supply certain essential information and technical service appears as illogical as it would be to admit a physician to practice who was incapable of performing a diagnosis, on the assumption that he would employ a diagnostician to supply what he lacked, and that, after all, the administering of proper treatment or the operation was the great thing.

It would undoubtedly be gratifying to have the public understand fully the architect's function, but we feel that it would be extremely unfortunate if it was to become convinced that the profession held in contempt the practical features of building, the features that contribute to the health, safety and physical comfort of those whose money is expended. Already there is an impression in the public mind that architects are, as a class, impractical, and some members of the profession have been to considerable trouble to convince prospective clients that such impression was erroneous, at least in their own case, and that it would be unwise to divide their commission, employing an architect for only such features as he professed proficiency in, as grouping, planning, design and color, and engineers for the balance of the work. There has always been some difficulty in explaining a demand for authority over matters concerning which only a general or superficial knowledge is claimed, and we expect this to increase with a clearer understanding of the situation by the public. Unless architects are willing to become proficient in all the essentials of their calling and have the fact known, there is undoubted danger of their being eventually deprived of some of the authority and emoluments that they now enjoy. In that event it might not be necessary to license them as they would no longer be in a position to endanger the public health or safety any more than would the painter, sculptor or poet. In fact they would then be much in the same class so far as their work and its effect upon the public was concerned.

* * *

Corrosion of Steel in Concrete

SPEAKING on this subject some time ago, Dr. W. H. Walker, Director of the Research Laboratory of Applied Chemistry, of the Massachusetts Institute of Technology, said that every engineer is well aware of the fact that acidulated water, no matter how small the percentage of acid may be, tends to corrode steel by increasing the number of hydrogen ions present. It had been made clear, from tests he carried out, that there were certain alkaline substances present in concrete which corrected any acidity, and so protected the contained metal work from corrosion. This fact has an important bearing upon the question whether concrete will protect iron or steel from corrosion. Inasmuch as Portland cement, when it sets or hardens, liberates a quantity of caustic lime, which is a strong alkali, the answer to the question must be in the affirmative. Iron or steel will not corrode when imbedded in good concrete. But caustic lime is soluble in water, and poorly made concrete is not impervious to moisture. Therefore, if iron be imbedded in concrete through which water is allowed at any time to percolate, this calcium hydrate will be slowly but surely dissolved. With it will disappear the inhibiting action of the concrete; and iron embedded therein will, in time, rust and become corroded. To ensure absolute protection of the reinforcing members of concrete construction, therefore, such concrete must be of good quality, and sufficiently dense and carefully made to render it waterproof.

Faults of Engineers from the Contractor's Viewpoint

INTERESTING observations bearing upon the relationship of the engineer to the contractor are contained in a paper presented recently before the Albany Society of Civil Engineers, by Mr. Richard W. Sherman, Chief Engineer of the New York State Conservation Commission. The following extracts from this paper are printed in a recent number of Engineering and Contracting:

Contractors are largely influenced by their opinions of engineers. The engineer who has a reputation for ability, honesty, fairness and good disposition, will attract bidders for any work of which he has charge and the desire to do work under him would be an incentive to reasonably low prices. On the contrary, if contractors consider an engineer incompetent, dishonest, an inebriate or of a cranky disposition, they will often avoid bidding on the work of which he has charge or add to their bids a sum which they hope will cover the excess cost of the work due to the unfavorable attributes in the make-up of the engineer. It is a feature of contracting to "size up" the engineer with as much accuracy as possible, and many contractors become very expert thereat.

In bidding for work, contractors are almost as sensitive as weather vanes. As a rule, they run quite a risk of loss if they bid too low; and the engineer is at least one of the most important features in the situation, as by reason of the characteristics of the engineer it may be possible to make a profit at a given bid under one engineer and impossible to avoid a loss under some other engineer with all conditions, aside from the engineer himself, precisely similar.

Contractors who do not care for the contract often bid fairly high without any expectation of securing the contract, but merely to avoid a reputation among contractors of being low bidders and with the bare chance of getting the work at good prices. Excessively high bids are usually the result of lack of knowledge of the value of the work, lack of time to become familiar with it, and not infrequently from a variety of reasons by which the engineer has been "sized up" so unfavorably by some contractors that they do not want the work under him, are prejudiced against him and the work and consequently unintentionally or otherwise bid too high. The treatment which bidders think they will receive from the engineer if they secure the work is an important feature of the bidding.

If an engineer's preliminary estimate is believed to be too low it drives away bidders and tends to indifferent high bidding. Some over-anxious contractors may be influenced thereby to bid too low. They may secure the work, in which event the engineer has an unpleasant task during construction. There is almost sure to be a disposition on the part of the contractor to save himself from loss, and he is thus tempted to slight or cheat in the quality of the work which the engineer tries to prevent (as he should). The engineer, no matter how fair and just he may be to the contractor, will usually end with a feeling of enmity toward him. Both contractor and engineer are in some degree injured by the work having been done at less than cost. It is detrimental to an engineer to make a practice of making his preliminary estimates higher than the prices at which it is later found the work can be let to reliable parties. On the other hand, great annoyance and trouble and, in most cases, detrimental features which in one way and another causes loss to the owner and detriment to the reputation of the engineer result from making preliminary estimates too low.

In the matter of monthly and final estimates, contractors, particularly those ignorant of engineering, are very prone to suspect that engineers have under-estimated or cheated them. There never has been any good reason why contractors should not check up measurements and quantities even if it is necessary to employ contractors' engineers to do so. In large contracts this has been the custom for some years and is becoming more so. Many more engineers than formerly are engaged in contracting and this feature adds to the practice of contractors measuring and checking up estimates. It is to be hoped that this practice will become general.

Great injustice has been done engineers, as many intelligent contractors know, by the perpetual suspicion that the engineer is under of having cheated contractors. There is seldom a motive other than spite for an engineer to cheat a contractor and the spite cases I believe to be very rare. In small works, for instance, such as village waterworks and sewers, some engineers may be tempted to under-estimate in order to keep the cost of the work down to the preliminary estimate or appropriations. I trust there are not many such, but I fear there are some.

An indolent, indifferent engineer and also a procrastinator, are torments to contractors and a cause of considerable unnecessary cost in executing the work.

Announcement

A DEPARTMENT of City Planning and Housing, to be edited by Charles Henry Cheney, Secretary of the California Conference on City Planning, will be started in this magazine with the February number, in which will be run notes on the principal items of City Planning and Housing interest in California and elsewhere. As there are very few books published which cover this new subject, it will be the aim of this department to keep the readers of the magazine posted on new municipal reports and other data now being so rapidly brought out by many American cities and public agencies. In this connection there will also be a brief column of reviews of current articles on these subjects in architectural and town planning magazines.

Following is a summarized report of the Town-Planning Committee of the American Institute of Architects:

While the correction of laws governing endeavor in the direction of city planning falls largely within the domain of city and State politics, and therefore outside the activities of the Institute, as such, your committee believes that in the field of education, in the assistance it may lend to communities striving for a realization of new social ideals, it can, with the earnest co-operation of its various chapters, as time goes on, fit itself to perform a worthy service both to the profession and to the country.

In fact, through the Journal the Institute is already engaged in disseminating much useful information, which is being put to good use in furthering the cause of city planning. It is interesting to note that Senator Borland of Missouri quoted from the Journal in support of his plea before the Senate, for the passage of the now celebrated "Alleys Bill" of Washington, and that in other ways the Journal has attracted the attention of Congress in relation to similar matters. It is hoped that the Journal may speak on these subjects with greater and greater authority as time passes, and it would seem highly desirable, therefore, that contact between this committee and the Journal should be intimate and constant.

It is, therefore, recommended that the Committee on Town Planning be continued; that it be provided with funds sufficient for it to proceed at once, independently, without the assistance of the several chapters, if that seems best, with a program for equipping a bureau of definite information concerning city planning, embracing maps, plans, photographs and lantern-slides of executed and projected work, and copies of laws governing actual procedure and construction; that its headquarters be located where constant and intimate contact with the office of the Journal may be sustained.

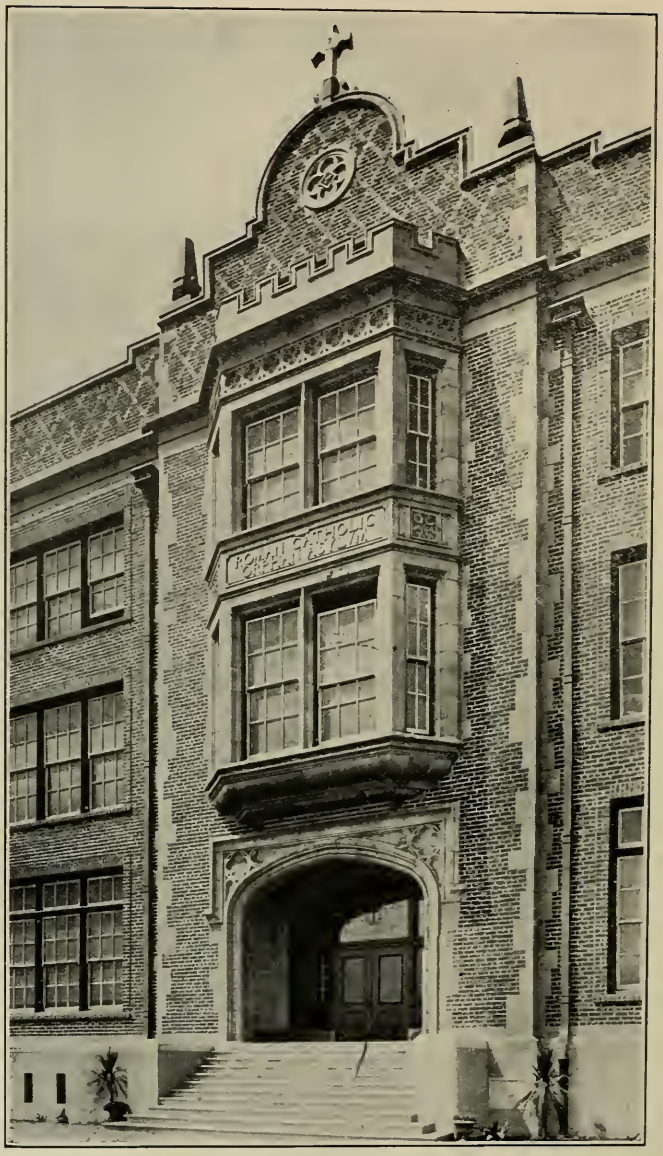
The committee which reported on this report recommended that the committee investigate the matter of co-operation with such bodies as the National City-Planning Conference, to the end that its work may be carried on without duplication and expense. The recommendation was approved by the convention.

Mr. George B. Ford addressed the convention on the work of the National City-Planning Conference, and once again pointed out the duty of the architect to lead in city-planning work, since his qualifications fit him better for that task than those who are now trying to lead.

M. H. Whitehouse,
Elmer Grey,
W. R. B. Willcox, *Chairman.*

REPORT OF THE BOARD OF DIRECTORS

The Committee on Town Planning, pursuant to instructions of the last convention, has endeavored to ascertain whether the town-planning movement in the United States is widespread and genuine. It finds many communities appointing town-planning commissions and receiving with considerable enthusiasm the reports of such commissioners, but little actual interest in providing the ways and means for carrying out their recommendations. The amount of space which the newspapers and magazines are devoting to this subject would seem to be a rare indication that people are interested, but the lack of tangible results would seem to indicate that the interest is superficial and attaches to the spectacular features and not to the fundamentals of city-planning. The committee recommends the equipment of a bureau of information embracing plans, photographs, lantern-slides and copies of laws governing procedure and construction, and that its headquarters be in intimate contact with the office of the Journal, through which its educational work may be carried on. The board is in hearty accord with these recommendations and hopes that during the coming year funds may be available to make a start in collecting the necessary material for such a bureau.



CENTER BAY, ROMAN CATHOLIC ORPHAN ASYLUM, SAN FRANCISCO
SMITH O'BRIEN, ARCHITECT
A LATE EXAMPLE OF GOOD BRICK WORK

The Antiquity of Brick

BRICK, the venerable and reliable building material—unmistakably the oldest thing made by civilized man, as far as records determine—gives evidence of architecture on earth. It was the earliest substantial building material, and is the latest. Six thousand years of history which embrace the entire known period of human civilization deal with brick. The earliest sunrise of enlightenment on the far-away plains of Babylonia, in the remotest time of which we have no man-made record, revealed towers and walls of burnt brick. Today men are still building of the same material, and they expect their structures to stand as long as some of those in the Eastern countries stood.

Statistics are generally considered pretty dry, but the simple statement that 25,000,000,000 bricks are made annually in the United States can be appreciated and remembered. The full meaning of this enormous number is brought home when it is considered that it is but a single factor in a vast accumulation; that it is added to what we already had; that it increases by that much the country's wealth of brick, for few are destroyed, and every year adds 25,000,000,000 more. That is enough to lay a five-foot sidewalk eight times around the world. The enormous output is not ahead of demand, and this ought to be proof that the brick that came sixty centuries ago, came to stay.

It is worthy of thought that the first important building material invented by man was the most durable thing he ever invented. Some minor improvements may have been made since, but in the main essentials the bricks in the Tower of Babel were as good as those of today. Man reached the limit of possibilities in brick-making—at least in durable qualities—earlier than any history records. He did the same with the bow and arrow, for there was absolutely no improvement in the bow, as far as known, from the days when the archer "drew a bow at a venture" and pierced the armor of Ahab, at Ramoth-Gilead, down to the battle of Crecy. Five thousand years after the bow reached perfection it was laid aside for something better; but not so with brick.

It is a matter of interest, though purely an academic question, how men learned to burn brick. It was probably learned accidentally and experimentally. A brick is no more and no less than an artificial stone, in the making of which great heat has played a part. It is a common thing in nature, and doubtless the early brick makers took hints from lava flows. Some lavas are so much like some kinds of brick that a broken piece of one could scarcely be distinguished from a fragment of the other. For instance, the buff-colored feldspathic lava from Mt. Shasta in California looks, when freshly broken, like a piece of buff brick; while the hard, metallic, basaltic lava, so common in some parts of New Mexico, is the picture of the hard, vitrified brick with glassy surfaces. There can be little question, though direct proof is not at hand, that the Babylonian brick-makers who worked wonders in Sargon's kilns at Akkad, 3,800 years B. C., were putting into practice lessons learned in the volcanic regions of the Northern plateaus.

Be that as it may, all historical and archaeological evidence points to the valley of the Euphrates river as the region in which the art of brick making was developed and it had reached practical perfection nearly or quite 6,000 years ago, as is evidenced by the remains buried in mounds of that cradle of civilization. This refers to burned brick, not to sundried cakes of mud. No one knows when these were first made, and the

MALABAR SCHOOL — END DETAIL SHOWING EFFECTIVE BRICKWORK WITHEY & DAVIS, INC., ARCHITECTS

question is of little practical importance, though it might be interesting. Bricks dried by the sun and left unburnt are of little importance in this country. Doubtless such were made long before the art of burning bricks was discovered.

When modern excavators began to dig into the vast mound which is believed to mark the site of the Tower of Babel, they soon came to layers and heaps of bricks which had passed through heat so great as to vitrify the surface. Theologians were the first to suggest a cause for it. They saw in the hard, glassy bricks many pieces of evidence to substantiate the biblical story of the confusion of language and the destruction of divine wrath of the monument erected by sinful man to escape another flood. It was pointed out by biblical scholars that the glassy surfaces of the bricks must have been due to repeated and terrific strokes of lightning—therefore, the Tower of Babel must have been destroyed by lightning as a punishment for wickedness and a warning to ambitious man not to attempt to reach forbidden heights.

Scientists took the same facts and placed quite a different interpretation on them. Instead of a bombardment of lightning sufficiently fierce to half melt the surfaces of the bricks—a thing absolutely impossible under the laws and phenomena of nature—a reasonable and simple explanation was found. The vitrified bricks had been regularly and properly burned in kilns before they were built into the massive foundations of the Tower of Babel. The builders knew enough of masonry and architecture to understand that the best and strongest material must go in the foundation in order to support the great weight above, and there was where they placed the best-burned bricks, and there is where excavators find them after thousands of years. The tower was said to have been 600 feet high, but that figure is doubtful. There is no doubt, however, that the hard bricks excavated were capable of sustaining the enormous weight of such a superstructure.

That is going back a long time, but the information is worth the journey. It throws light on a good many phases of life on economic conditions in that remote period. Modern man is prone to consider himself everything and the ancient man as a barbarian dressed in goatskins, fighting with sharp sticks for spears, living in tents, and subsisting on his flocks, or the chase, with a little assistance from crude agriculture. Excavations of the Chaldean mounds show a different state of affairs. The ability to burn bricks capable of standing the elements 5,000 or 6,000 years is proof of a civilization of high order; because the presence of skilled brick makers implied the presence of competent mechanics of other kinds—architects, smiths, lumbermen, irrigationists and merchants to carry on the trade of an empire. No great industry stands alone. It cannot do it. Unfortunately, time, war and decay have blotted out almost everything pertaining to that ancient civilization—except the most indestructible part of it, the brick. In later times kings stamped their names and engraved their laws on bricks, but the most ancient are plain. Yet those most ancient blocks of burnt clay tell a story filled with human interest.

Take, for example, the matter of burning the millions of bricks which the Babylonians used. Where did the wood come from for firing the kilns? It is a forestless region now with only a few ragged fringes of brush along the nearly dry, meandering water courses; and there is reason to believe that it was practically in the same condition 27 centuries ago, when the only mention of trees was a fringe of willows along the rivers where the captive Hebrews hung their harps on the willows by the rivers of Babylon and wept. Our "weeping willow" came from there. But 2,000 years before

that time the brick-kilns were filling the Euphrates valley with their smoke, and doubtless wood was then plentiful.

When Nebuchadnezzar, as it is recorded of him, looked about him and exclaimed with exultation and pride, "Is not this great Babylon which I have builded?" He was looking upon a vast brick-built city. He was himself one of the world's greatest brick makers. It was doubtless necessary even in the comparatively early time in which he lived to raft wood down the Euphrates and Tigris rivers from the highlands of Ararat and the Anti-taurus mountains to supply his brick burners; but the wood was forthcoming and the brickkilns turned our their products by millions. Nebuchadnezzar was not only a mighty brickmaker, but he was also one of the most elaborate advertisers the world has seen. His name was stamped on every brick that came from his kilns.

"Nebuchadnezzar's furnace" has become a proverb. It is a term used to convey the idea of intense heat. The specific use to which he put it on one occasion made it famous; for there he ordered the three rebellious Hebrews, Meshach, Shedrach, and Abednego, to be burned alive, according to the biblical narrative. As a preparation for the proposed cremation he ordered the furnace to be heated "seven times hotter."

What was Nebuchadnezzar doing with a furnace? This is a fair, practical question. It does not appear that he maintained a furnace for the special purpose of burning unfortunate prisoners; on the contrary, the reading of the narrative shows that he acted on the impulse of the moment when he ordered the prisoners burned, and not deliberately (though tricked into it) as when he ordered Daniel thrown into the lions' den. The plain facts probably were—as far as the narrative is a statement of facts—that the famous furnace was simply a brick-kiln. That, at least, is a reasonable interpretation of it. Doubtless the brickyards were in the suburbs of the city, and the great interest which the king took in brickmaking would cause him to think of a burning kiln the first thing when he wanted to inflict prompt and terrible punishment.

How hot were Nebuchadnezzar's brick-kilns? That is not a foolish question or one wholly incapable of being answered, though it might seem so at first thought. There were, of course, no thermometers then for measuring temperature, but the condition of the bricks themselves is a record of the fierceness of the fire through which they passed. Heat produced the same effect on clay then as it does now; and comparing some of the hardest burned of Nebuchadnezzar's bricks with the product of modern kilns where the degree of heat is known, it is found that some of his kilns were heated from 1,800 to 2,200 degrees Fahr. It is difficult to attain much greater heat than that when wood is the fuel, and it is evident that his brickmakers understood how to build kilns which developed the largest amount of heat from the fuel in use.

It has not been necessary to burn brick on a large scale in the Euphrates and Tigris valleys during the past 2,000 years. In the first place there has been little fuel available for that purpose; in the second place, the region has sunk so low in civilization and has been so greatly devastated by wars that the inhabitants have been discouraged from erecting large buildings. But those who have put up houses have simply dug the necessary bricks out of mounds which mark the sites where ancient cities stood. This has been going on for 2,000 years and plenty remains. The bricks now in the walls of a poor Arab's hut were once part of a palace. Time, war, flood and fire have leveled the ancient edifices, but the bricks remain, and many of them are as serviceable today as they were when first laid up in masonry a thousand years before Abraham crossed the Euphrates on his journey westward to the land of Canaan.—Rock Products.

The High Cost of Incompetence

Are present-day methods of architecture and construction all wrong? Mr. S. Kruse, a Minneapolis builder and owner, contends they are, in a forceful article in the November Real Estate Magazine. Kruse puts things in black and white and he calls a spade a spade. He overdraws things a bit, but the real competent architect will recognize that Mr. Kruse knows his subject and is hitting the nail squarely on the head.

While we do not approve of his plan to totally eliminate the architect as a direct employee of the owner and engage, instead, a competent and financially responsible construction firm which has in its employ qualified designers and engineers, we do feel that a rigid license law should prevail in every State, making the requirements for admission most stringent, and thereby ridding the architectural profession of incompetents.

As a prelude to Mr. Kruse's paper, Mr. F. W. Fitzpatrick, consulting architect of Washington, has written for this magazine an interesting commentary under the Caption, "The Owner's Point of View."—EDITOR.

By F. W. FITZPATRICK

THE average architect really believes that his most important function is fulfilled when once he has designed a beautiful, much be-columned and highly ornamental exterior for a building. He stands ready to sacrifice almost any advantages of plan or economy of construction to that "front." Indeed, his whole education and training has been "frontward," so one can't wonder much at that most natural and highly cultivated bent.

But it has done him harm and may yet be the Waterloo of the profession. Men who pay for buildings have grown to want more than monuments to their architects' artistic and decorative ability, they want profit, they want every penny spent where it will do the most good; they want service, in other words, and are realizing that they are not getting it in the highest degree from their architects.

I have been preaching for years the gospel of greater service, more thoroughness on the part of the architects, exhorting them to set aside their wonted disdain of the merely practical details of planning and building, but the architects have pooh-poohed it all, thought I was just scolding, or sermonizing, or bidding for more business as a consulting or advisory associate. They rather fatuously believed they were giving all that could be expected of them in the regular, accustomed, usual manner sanctioned by long precedent, for were they not doing just as had been done by architects for years and years?

But that is exactly what the people **don't** want. Things have progressed, more is expected of everyone; he who lags behind is liable to be lost, forgotten and new ways are constantly being devised for doing what he may have so well done years ago. That is what is happening in architecture, the writing I've seen upon the wall, the construction of buildings by construction companies direct, with architects as mere subordinates, not as directors and representatives of the owners.

Hundreds of owners have felt they were not getting their money's worth through the architects, some have sued the latter for mistakes and losses but, so far, the courts have assumed that architects act as agents for the owner, therefore the latter were responsible for such errors and couldn't recover. A broader and more equitable view of the law is the order of the day and owners are beginning to know just where the trouble lies and are seeking redress for it or a preventive.

Mr. Kruse, the owner and builder of a large hotel in Minneapolis, the Radisson, himself a lawyer, has written a most severe arraignment of the

architects, excerpts of which are given in the succeeding pages. It voices the sentiments of probably eight out of ten people who build. Unwise, indeed, will it be for the architects to dodge it or loftily ignore it. Better far for them to read it with the greatest attention, digest it most thoroughly and then sincerely and earnestly set to work to render such service, if it is possible, as will impel the owners to continue things as they are now, rather than resorting to the expedients (found right at hand) Mr. Kruse describes and recommends, and that if adopted spells nothing more nor less than the extinction of architecture as an independent profession.

The High Cost of Incompetence

By S. KRUSE, Builder and Owner, Hotel Radisson, Minneapolis

NEXT in importance to the science of building operation and management, is the science of building architecture and engineering. Sooner or later, every building operator will be interested either as designer or builder. It is of the utmost importance that, before becoming involved, he have an accurate conception of the real status, function and legal liability of the architect.

The courts define the relation between owner and architect as that of principal and agent. Out of this fundamental principle grew the doctrine that the architect as the agent of the owner is purely advisory. In theory he is supposed to be directed by the owner as to the design and construction; in fact, as to all details of the proposed building. The architect, as the agent, was supposed to take these instructions and develop them into one harmonious whole and was, theoretically, supposed to deal directly with the contractor for the purpose of giving to the owner the building, including material, that the owner had determined on.

As a corollary to the doctrine of agency, grew the principle that the architect is not responsible for errors in judgment, or errors in employment of contractor or sub-contractor, or errors in the selection of material, or errors in the superintendence, providing he exercise such care and skill as was customarily exercised by members of his profession. From these two fundamental rules our entire system of jurisprudence pertaining to relative rights of owner and architect have grown.

Rule Prejudicial to Owner

The relation between owner and architect as one of principal and agent operates very satisfactorily so long as building construction is simple in its nature. The difficulty with this principle and the injustice of it to the owner becomes apparent when building construction becomes complex and when the sciences of sanitation, ventilation, heating and plumbing, electricity and transportation are incorporated in the construction of our mammoth buildings. It was formerly, and to a large extent is now, the practice to entrust to the architect, the employment of the necessary engineers and specialists. It becomes apparent, that where the architect is entrusted with the employment of these specialists that either through ignorance, incompetency or dishonesty on the part of any of the specialists employed, the owner may be the heavy loser. This follows for the reason that under the doctrine of agency the mistake of the architects is the mistake of the owner and the consequent loss must be borne by the owner. It also becomes apparent, in order to avoid the responsibility for loss, there is ony one recourse for the owner, viz., to make the selection personally. This is not practical, as the owner is not competent to determine the qualifications of any so-called expert to perform the necessary service. The result under

this system is that in a large building project, under the doctrine of agency, the owner places himself wholly into the hands of his architect and is wholly at his mercy.

We can readily imagine the predicament of the owner who falls into the hands of an unscrupulous or ignorant architect, and in this respect there is no practical difference between ignorance and dishonesty, as the results are the same. The reader will further realize the precarious situation of the owner, when we consider that practically eight out of ten so-called architects are wholly incompetent and unfit to undertake large building construction and determine the various problems incident thereto. The architect as a specialist is practically on a par with the other professional men. It is a well known fact that the average American professional man is unfit and incompetent to assume the serious responsibilities of his profession. This is so by reason of insufficient education and by reason of lack of intellectual interest in his profession. It is a fact that the interest of the average professional man is purely commercial and his principal thought is how many dollars he can derive therefrom with the least labor.

In American communities, the commercial spirit will always rule. It is not a question of honor, or integrity, but solely a question of realizing as much money as possible on the smallest investment, either of time or money. The man who can secure the largest profit on a given investment is looked upon with admiration. This spirit pervades even the professions. It is not to be expected, therefore, that the architect will hesitate to advise his client to undertake a large building project, for the larger the project, the larger the fee. He will encourage his client to undertake a building project involving millions without questioning whether the project is practical and without questioning whether the client will lose or gain. These questions, the architect reasons, are for the client to determine, and in the event the project is a failure, it is, of course, chargeable to the client's folly. Such is the reasoning of the architect. In reality, the relationship of the architect to the owner is that of trustee and beneficiary. Being imbued with American commercialism, he has no liking for a trust relationship and consequently disregards it and takes advantage of his position for his pecuniary gain.

Says Average Architect is Incompetent

Another reason for abandoning the rule is the fact that the average architect is incompetent for larger work. The architectural student spends three or four years at school and is then graduated. Having no interest in his profession except a commercial interest, he does not pursue his studies after graduation. The result is that when he is employed on large construction he is wholly unfit to render efficient service. He, not knowing the requirements of modern business, is not capable to select experts. Not knowing the subject himself he cannot judge the qualifications of another. It is not improbable, therefore, that when he employs expert service he will, in his ignorance, select men who are as incompetent as he.

A common practice in an architect's office is to call into consultation the representatives of firms dealing in specialties. The writer has observed the draftsmen of an ornamental iron company preparing plans and specifications for the architect of the iron work; representatives of the marble company submitting plans of the marble installation; representatives of electric firm drawing plans of the electric work. In return for service in preparing such plans, the architect urges his client to let the contract to the firm that prepared the plans and specifications. The reason is apparent—the architect does not know how to prepare the plans and specifications or is

too indolent to do so. In case the owner refuses to comply with the architect's directions there is trouble. These are facts that are within the knowledge of the writer and of most every salesman and builder.

The writer has been assured that in many offices the successful contractor "must pay the architect a percentage in order to keep him good natured and to secure an O. K. on the work promptly."

The plans and specifications of the average architect covering a hotel or office building project are usually so imperfect and impractical as to be worthless. If adopted as a basis for contract, it gives to the contractor every opportunity to claim extras for he is not obliged to do any work not specified in the plans and specifications. This is frequently the reason why the owner must pay many thousands of dollars as extras, in order to secure a practical and finished building. In the opinion of the writer, if the owner wants practical and complete plans and specifications "he had better prepare them and then submit them to his architect to draw them to scale."

If the owner cannot do this, then he had better not build. Witness the tragic story of many of our large hotel and office building projects; trace the project from its inception as a promotion scheme of which the architect was the leading spirit, through the many stages of construction, resulting ultimately in foreclosure of the bonded indebtedness, and the owner involved in financial ruin. Observe again the number who have lost the savings of a life time in enterprises of this character, and still others, who because of these conditions, have sought relief in suicide. The writer knows two cases of this character traceable wholly to the ignorance and dishonesty of architects.

Thinks Architects' Charges Excessive

Another reason for abandoning the rule is the fact that the basis of charge for architectural service as determined by the American Institute of Architects, is excessive. The usual basis of charge for plans and specifications, with superintendence, is six per cent of the aggregate construction cost.

The time spent on a one million dollar building does not exceed two months for preparation of plans and specifications and about ten months in superintendence of the building construction, yet his fee is $60,000. Four-fifths of the work is done by subordinates, usually drawing salaries of from $15 to $25 per week. It will be observed that the architect demands his percentage not only on the cost of the building construction, but also on the cost of the entire mechanical equipment, electrical installation, ventilation installation, and, in fact, on all items pertaining to the cost of the building. He will demand this "even though he was not employed or concerned in the mechanical installation," and even though the owner employed and paid the engineers therefor. The writer is informed of five specific instances where the architects took this attitude solely on the theory that the mechanical equipment was part of the building cost and, therefore, under the form of contract as drawn by the American Institute of Architects they were entitled to six per cent compensation.

The fourth reason for abandoning the rule is the fact that the average architect is not practical in specialty building or design. The owner assumes that his architect is informed of the requirements of modern business building and will incorporate these requirements into his plans and specifications. Relying on this assumption, the owner does not carefully inform himself, or employ an experienced and expert manager to revise the architect's plans. The result is that when the plans and specifications are submitted and adopted they are in many details wholly impractical, and the

building constructed pursuant thereto is a financial failure. Modern business in most all lines is very complex, and each business usually involves many specialties. The ability to prepare practical plans and specifications in any of the departments of any given business requires a specialist who has become so by reason of years of training and study. The average architect is not a student, he is usually only a draftsman.

The writer employed, on a hotel project, a firm of architects reputed to be the best in the Northwest, who had upwards of forty years of building experience, and, by reason thereof, had the absolute confidence of the owner. These gentlemen, no doubt, did the best they could, and yet the following were some of the items of their work:

Embedded steam pipes in concrete floor slabs with the result that the expansion and contraction of the pipes in the slab caused the pipes to break and to leak through the slab.

Embedded service pipes in the wall in such manner that when a leaks occurs, or repairs are necessary, it is necessary to tear away the wall in order to gain access to the pipes.

In a twelve-story hotel project, omitted plumbing shafts.

Installed duplicate soil and supply pipes where one set would serve the purpose.

Selected bath tubs of such size and built the entrance doors to bath rooms so small that when the tubs arrived, it was found that they were too large for the entrance doors, and holes had to be cut into the bath room walls before installation of tubs could be made.

Gave the building windows of four different sizes, thereby making it necessary to purchase curtains and window shades of that number of separate and distinct sizes.

Dead arms approximately twenty feet in length on hot water service lines.

Refused to submit any plans of electric fixture installation, plumbing plans, ventilation system, kitchen installation, office design, furniture layout, on the pretext that that is no part of the architect's contract who has undertaken to prepare complete plans and specifications of a hotel project.

These gentlemen represented that the completed hotel of 250 rooms would cost not to exceed 25 cents per cubic foot, when in reality after correcting the architect's blunders, it cost much more.

It is apparent that a legal proceeding against an architect is a fruitless task. It reminds one of the story of Frederick the Great, who one day undertook to punish the Polish King. The King returned after the completion of a military campaign empty handed, with nothing except the fruitless glory of victory. When asked what success he had achieved, he said he was in the position of the devil who went wool gathering, but found nothing except wild hogs, and he undertook to gather wool from them. When asked as to the result of his attempt, he said, "Great cry, but little wool." So is the attempt to collect damages from the average architect.

Suggestions as to Remedy

The writer has frequently discussed the situation above outlined and has come to the conclusion there are two remedies. To those who are of the opinion that it will serve their interests best to entrust same wholly to an architect, the contract relation between them should be reduced to writing, and somewhat along the following lines:

After informing the architect of the sum the owner desires to spend, the parties should agree: First, the architect to prepare preliminary sketches and for which there is to be no charge. After submission of the sketch, the owner to have the right to proceed or not to proceed and in either event, is not to be liable to the architect for any purpose.

In the event the owner, after receipt of preliminary plans and specifications, decide to specifications. On submission of the same, the owner to be liable for one per cent of the contraction of the pipes in the slab caused the pipes to break and to leak through the construction and in the event he does not proceed, then his liability to be limited to the one per cent of the estimated cost.

In the event the owner, after receipt of preliminary plans and specifications, decide to proceed with construction, then the architect is to prepare detailed plans and specifications covering the entire construction phase of the building and in a manner satisfactory

to the owner. On receipt of same, bids are to be secured thereon. In the event the lowest responsible bid exceed the construction cost as limited, then the owner is not to be liable to the architect for any further compensation. If the lowest responsible bid do not exceed the construction cost as limited, then for plans and specifications, the owner is to pay the architect two per cent on the actual cost. The owner, however, has again the option to proceed or not to proceed with the construction, and in the event he decide not to proceed, then he is indebted to the architect not to exceed two per cent on cost as appears from the lowest bid.

On acceptance of the detailed plans, and the receipt of the lowest bid, the question of superintendence arises. The owner has the option to employ the architect, or to employ an independent inspector. In the event he select the architect's superintendence, then he is to pay him therefor on a basis of two per cent of the actual cost of the building with the proviso, however, that he may discontinue the architect's service on any day the owner so desires and on so doing the architect's compensation for service for superintendence to be computed on a pro rata basis.

The advantage of a contract along this outline is that the owner at all times is absolute master of the situation. He will avoid the danger of placing himself at the mercy of the architect, and in the event that he does not proceed with the building, will avoid controversy over fees. Also, under an arrangement of this character he will secure far better service for the reason that the architect, being aware that his service may be discontinued at any moment, will be more anxious to please, and less arbitrary. It is the experience of the writer that in the employment of men it is policy not to enter into any arrangement that will in anywise interfere with the owner removing an employee at will.

The construction contract should be given to one person or firm for all the construction work. By this method the owner avoids the annoyance of wrangling among the various sub-contractors and their employees, and he avoids the claim so frequently made by a contractor that the defective work of which he is accused, or the delay for which he has been called to account, is due to the negligence of another contractor, or his employees. It also avoids the argument so frequently made by the architect when he is charged with negligence, or incompetency, that the situation is due to the negligence or incompetency of some certain contractor or his men and was in no wise chargeable against the architect. By letting to one person a contract for all the work, that person is forced to assume all the difficulties and tribulations to which the owner is exposed when he lets contracts to numerous sub-contractors. It is noteworthy that a great number of the larger building constructions today are undertaken on this plan, and the writer has not learned of a single instance where its results were in anywise unsatisfactory.

Objections Considered

The architect will reply hereto by saying that his self-interest will impel him to give his client the best of service. Theoretically, the answer appears plausible. In practice, however, the argument is not applicable. The average architect, as the average lawyer, or doctor, will take any case that is submitted to him, regardless whether he be competent or otherwise. The human being is so conceited as to consider himself competent to undertake any case pertaining to his profession. Once having secured his commission he will render such service as he may be able and then claim that he has complied with his contract and, therefore, entitled to the compensation.

Another objection is that even though the owner should enter into a contract along the lines above indicated yet it will be economy for him to employ a competent architect. The architect claims he is more familiar with construction and its economies and, therefore, can save for the owner an amount of money exceeding the architect's commission. This argument

also appears plausible, but is fallacious in so far as it assumes that the architect knows the economies of construction. The fact is that the average architect does not know the economies in construction and has but little knowledge of construction cost. When sued for damages on the ground that he misrepresented as to cost, his answer is that in his professional capacity he is not supposed to advise as to cost; that that is not one of the professional duties of the architect, and that the owner has no right to rely on any opinion the architect may express as to cost.

Lost Entire Investment

The importance of this subject is emphasized by the experience of Mr. Collins of the Dyckman Hotel. He was a hotel operator of many years' experience, and interested in promoting a hotel project on certain lines. As was reported from the testimony his architects represented the total construction cost would not exceed $400,000. Thereupon he entered into a lease with the owner of the ground, whereby the owner agreed to erect a building pursuant to those plans on a rental basis of 5 per cent per annum on the value of the ground, 8 per cent per annum on the cost of the building, and 9 per cent per annum on the cost of plumbing, steam and special installation, together with taxes, assessments and insurance. The building was constructed and, as is reported, the ultimate cost thereof aggregated $600,000. As a result of three years' operation of the hotel, Mr. Collins was obliged to discontinue, being in arrears in rent for approximately two years and in bills and accounts payable in a very large sum. One of the reasons for his failure was the fact that because of the increased construction cost, over and above the limit placed by his architects, his rental was increased to such an extent that he could not successfully operate the house.

Mr. Collins, so it is reported, lost his entire investment. His claim against the architects is without value, for the reason that the opinion as to cost, legally speaking, is an expression of opinion outside of their professional duties, is not binding on them and is not a ground for claim for damages.

Investigation of this subject leads one forcibly to the conclusion that there should be either a change in the antiquated methods heretofore employed or stringent legislation, making the architectural profession a licensed profession, making the requirement for admission stringent, and making him legally responsible for misleading estimates and opinions and fixing his compensation on the reasonable basis, say, 3 per cent of the estimated cost.

* * *

Architectural League Exhibition

The thirteenth annual exhibition of the Architectural League of New York will be held in the building of the American Fine Arts Society, 215 West Fifty-seventh street, New York commencing Sunday, February 7, and continuing until Saturday, February 27, inclusive. The annual dinner is scheduled for Friday evening, February 5, and the league reception for the following afternoon. The exhibition is illustrative of the architecture and allied fine arts. It will consist of drawing and models of proposed or executed work in structural, decorative and landscape architecture; sketches and finished models and monumental sculpture. Cass Gilbert is chairman of the committee of the annual exhibition and jury of selection. The jury of architecture is composed of Richard M. Hunt, Edwin H. Blashfield, Cass Gilbert, Isdore Konti, Donn Barber, William M. Kendall, Charles A. Platt, Philip Sawyer and S. B. T. Trowbridge. There will be competitions for the Henry O. Avery prize and a special prize of $300.

THE
Architect and Engineer
OF CALIFORNIA

Published Monthly in the interests of the Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast by the Architect and Engineer Co.

BUSINESS OFFICE AND EDITORIAL ROOMS
617-619 Monadnock Building, San Francisco
Telephone Douglas 1828

TERMS OF SUBSCRIPTION
(Including postage) to all parts of the United States $1.50 per annum; to Canada 50c additional; to all Foreign points $1 additional.

Vol. XL. January, 1915 No. 1

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DEVELOPMENT OF THE MOVING PICTURE THEATER

Next month The Architect and Engineer of California will publish an interesting article on "The Development of the Moving Picture Theater," showing some of the latest examples of motion picture houses in Pacific Coast cities. It is gratifying to note that architects are now given an opportunity to design something better than a "corrugated iron shack" which marked the initiatory stages of the "movey" craze. Referring to the hap-hazard construction that has characterized the moving picture theater in the past, the Builders' Guide of Philadelphia comments:

There is no doubt in the mind of any sane observer that the building of "movie" theaters,—so far as Philadelphia is concerned,—has been overdone. Nor is there any doubt at all that most of the buildings dedicated to this form of amusement have been underdone. When it is considered what really beautiful and artistic effects are possible with the use of architectural terra cotta in this field of design, one is moved to marvel at many of the garish, flimsy and hopelessly ugly affairs thrown up as "palaces of photoplay entertainment." The bulk of these are in ornamental sheet iron, a medium that while useful to a certain extent has somewhat sharply defined limitations. One of the chief objections to corrugated iron is that it deceives no one—not even the builder. Coat it as you may, plaster it with gold leaf, embellish it with lights, it remains under any and all circumstances frankly and even obtrusively—ornamental iron. This is not true of architectural terra cotta. Terra cotta has the "feel," the sense of solidity, the grace of outline of stone. It has an air of elegance, a wholesome genuineness about it that appeals. It is wholly free from that suggestion of the "shoddy" and the "gingerbread" that makes itself felt in the structure of sheet iron. A diminution in the number of the "movies" with a corresponding betterment in the quality of the building seems to be at this time more or less inevitable. We note, too, that the shoddy structures which marked the initiatory stages of the "movey" craze are gradually being abandoned or handed over for remodeling for other lines. The moral is that spurious building doesn't pay, and that an attractive structure designed by a competent architect and made of approved materials is as necessary to success as first-run picture features or extensive advertising.

COLOR IN MODERN ARCHITECTURE

Writing about the lack of color in modern architecture, Mr. Charles de Kay, the noted art critic of New York, alludes to the bas-relief in enameled tiles at the exhibition of the Architectural League in New York, as follows:

Notwithstanding all that has been done in the way of tiles to decorate the interior and exterior, the fact remains that our architects are not taking the advantage they might of this material to enrich the townscape and provide sumptuous and lasting color schemes for churches and capitols, hotels, libraries and railway stations, public and private houses.

The color notes from smooth or dull or unevenly surfaced products of the kiln have been so far mild enough, discreet enough, well enough suited to the timidity one meets when the question of color comes up. Even these anemic hues are often set aside for drab or dead white walls unrelieved by anything save windows in monotonous rows whose deadly iteration numbs the mind and steeps the soul in gloom. By the deft introduction of tiles in smooth or dull glazes much might be done to render tall buildings less repellant and to some degree disguise the enforced but ghastly regularity of their fenestration.

Tiling can be varied in tint to prevent a too solid color; it can be modelled in relief to obtain effects of shade. Chance alterations in tone, or "hazards" of the kiln allow the architect a gamut color vibrations on which to play the changes. Perhaps through this material we shall have presently an architecture better suited to our brilliant atmosphere, our autumn woodlands, than the doleful kind we inherit from Europe. In the hands of architects who have some feeling for color we should have rich and varied decorations for schoolhouse and city hall, hospital and public library, clubhouse and theater, market and museum. We should demand to be at least as favored in this way as were the men of the middle ages and the ancients of Greece. Assyria and Egypt when they built their temples and palaces.

Architects Elect Officers

At the annual meeting of San Francisco Architectural Club, January 7th, the following officers were elected: President, Albert L. Lapachet; vice-president, Charles Peter Weeks; secretary, A. R. Williams; treasurer, William J. Helm, Jr.; directors, A. M. Loewenthal, Thomas Bendell and T. M. Pfluegger.

A Pleasant Compliment for Mr. Cahill

Improved Sanitary Fixture Co.
411 S. Los Angeles St.,
Los Angeles.

Mr. F. W. Jones, Editor Architect and Engineer, San Francisco, Cal.

Dear Sir:—May I say that I deem Mr. Cahill's article in your December issue a brilliant literary masterpiece—the best I ever read on an architectural topic. It is comprehensive, incisive, instructive, interesting and inspiring.

Yours sincerely,
George Huntington Barker.

Engineers to Have New Quarters

The San Francisco Society of Engineers has practically decided to move to the top floor of the Shreve building. Architect C. E. Gottschalk has prepared preliminary plans calling for an expenditure of about $10,000 in fitting up the entire floor for the use of the Society. If it is decided to go ahead with the proposition the Society will endeavor to materially strengthen its membership.

Architect Gottschalk Busy

Architect C. E. Gottschalk, who succeeded to the business in San Francisco of the late William Curlett, is unusually busy, new work on hand including a $25,000 Class C commercial garage for the Terminal Hotel interests, a $15,000 frame apartment house on Filbert street for Charles Farrell, a $70,000 Class C hotel and a number of smaller jobs.

Close Figuring

The sharp competition on recent construction contracts has resulted in much close bidding. At several of the lettings in the last few weeks, says Engineering and Contracting, the figures to the right of the decimal point have decided the award of the work. On a 100,000 cubic yard earthwork job the other day the low bidder put in a bid of 23.999 cents per cubic yard. The figure of his nearest competitor was an even 24 cents. The latter contractor was an old timer, who never bothered with the fractional part of a cent in his unit price. He was not exactly strong on fractions and he also believed in making it easy for the engineer to figure out the monthly estimates. On this work he had put in a particularly low proposal, and he felt quite confident of securing the contract. He was somewhat astonished, therefore, to find out that he had been under-bid. He figured it out: 100,000 cubic yards at 24 cents made $24,000; then he took his competitor's bid and, after some maneuvering, discovered that it totaled $23,999. He reflected on his problem for a minute and then broke out: "Well! Well! Well! The little divil won out by $1. That comes of having an eddication."

With the Architects and Engineers

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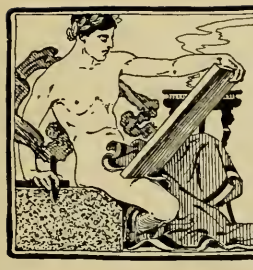
Architects' Homes Robbed

A number of Los Angeles architects are wondering why it is that the gentlemen who follow burglary for a profession have singled them out for victims. As the burglars in each instance secured a sufficient reward, their good judgment cannot be questioned at any rate. Among the homes entered were those of John Parkinson, of Parkinson & Bergstrom, Lyman Farwell and A. F. Rosenheim.



San Francisco Society of Architects

Regular Meetings Second Wednesday of Each Month

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Education—BERNARD R. MAYBECK, ARTHUR BROWN, JR., and JOHN BAUR.
Competitions—CHAS. P. WEEKS, WM. C. HAYS, and JOHN REID, JR.

December Meeting of San Francisco Society of Architects

The regular monthly meeting of the San Francisco Society of Architects was held at the University Club, California and Powell streets, on the evening of December 9th.

The Development of the Foot of Market Street, which was discussed at the September meeting, was given further consideration, and a committee was appointed to take charge of the subject and bring it up in a more comprehensive way at some future meeting.

Mr. Bakewell reported that the Loeb prize of $50 had been won by Mr. L. C. Rosenburg of San Francisco, and that Mr. F. Allamand, Jr., also of San Francisco, had been placed fifth in the competition. This is the first instance in which a San Francisco man has won a prize in the New York judgment of the Beaux-Arts Society and is a gratifying instance of the progress of student work in San Francisco.

Mr. Mullgardt reported that the committee on the appointment of a State Art Commission, which was appointed by the last Legislature, has submitted its report and that the subject will come up during the next Legislative session.

Mr. Mullgardt introduced the guest of the evening, Mr. Allen True, a painter who has been associated with Frank Brangwyn, A. R. A., in the preparation of the Eight Mural Decorations for the Court of Abundance at the Exposition, and who is now engaged in hanging them.

Mr. True gave a most delightful talk on his association with Mr. Brangwyn and on his work and personality. It developed that Mr. True was one of those rare individuals who have the patience and foresight to record some of the intimate sayings and doings of a great man and it was a distinct treat to be allowed to share some of them with him.

At the conclusion of his talk a unanimous vote of thanks was extended to Mr. True.

Seattle Chapter, A. I. A.

At the December meeting of the Washington State Chapter, American Institute of Architects, Harold Ogden Sexsmith was elected a junior member of the chapter.

A discussion of a proposed State Housing Law was held the bill introduced at the last session of the Legislature being the basis of the discussion. The chapter expressed itself as in favor of a simplified form of a State law, one that would define general requirements, leaving the details of the arrangement and requirements to be worked out by each community for itself to suit its own needs.

Professor Trevor Kincaid, of the University of Washington, delivered an illuminating address on the art and architecture of Japan, in which country Professor Kincaid had spent some time as a resident of the city of Tokyo.

Elected Fellows

At the recent convention in Washington of the American Institute of Architects Messrs. W. B. Faville of San Francisco and Fernand Parmentier of Los Angeles were elected Fellows.

Berkeley's New School Buildings

A statement of the proposed expenditure of the $500,000 in school bond money, issued by the Berkeley School Commission, is as follows:

Claremont school—For Cox property, $50,000; for 6-room building, $28,000; total, $78,000. Architect, Jas. W. Plachek of Berkeley.

Ward and Telegraph school—Property, $48,000; building, $100,000; total, $148,000. Architects, Hobart & Cheney of San Francisco.

South Berkeley—Building and property, $108,000. Architect, W. H. Ratcliff, Jr.

West Berkeley—Property, $35,000; building, $36,000; total, $71,000. Architect, Walter Reed, Oakland.

North Berkeley—Property and building, $82,000. Architect, Ernest Coxhead of San Francisco.

The equipment for buildings is set at $25,000 and the grand total is figured at $512,000. As there is available in the 1915 bond fund $512,857, a surplus over estimates of 857 is apparent.

A Song of Six Per Cent

An inside, professional view of the architect's scale of remuneration is contained in the following humorous verses, recited at a recent meeting of the Cleveland Chapter of the American Institute of Architects:

"Sing a song of six per cent.
Pockets full of dough,
That's what the client thinks
Because he doesn't know.
Poor darned architect
Knows he's just a slob;
Six per cent is not so much
Unless you've got a job.

Sing a song of six per cent
Arc'tec full of rye;
Million-dollar c'mmissions
Float before his eye;
When the night is over,
How his head does ache!
A yiddish flat at two per cent
Is what he'll gladly take."

Benefits of State License Law

At the last convention of the American Institute of Architects an interesting report was read on "Registration and Licensing of Architects," showing that the various states are fast providing laws for the licensing of architects. The laws in New Jersey, Louisiana, California and the proposed law in Missouri are all operated along similar lines. Referring to the benefits attained from the California Act, Secretary Sylvain Schnaittacher of the Northern California District writes as follows:

The great benefit of the act is in establishing the professional status of the architect who is licensed, as against the unlicensed practitioner, who is barred from competing for public work and also is in the position that if he sues to recover from a client for service, the fact that he is unlicensed is accepted as an admission of incompetence to perform the services for which he seeks to recover.

Institute Code Rule Suspended Affecting School Competitions

Members of the American Institute of Architects in California have been relieved of any professional embarrassment by the action of the board of directors of the Institute in suspending during 1915 the code relative to competitions so far as it may apply to school buildings erected in conformity with the law of 1872. This law requires school trustees to advertise for plans for buildings and provides that the architect selected must give a bond for $5,000 guaranteeing that the structure can be erected within the specified cost. The code of the Institute prohibits its members participating in competitions not held in accordance with the same and as the law of 1872 will not permit full compliance with the Institute code, the temporary suspension of the code will materially assist Institute architects engaged in school work. The suspension of the code was recommended by the Institute convention at Washington and the matter was referred to the board of directors, which took action in accordance therewith immediately.

Burying Hatchets

"To show how the spirit of peace now broods over the proceedings of San Francisco Chapter, A. I. A., under Mr. Faville's presidency," remarked a member the other day, "it is gratifying to note that several long standing feuds were forever ended at the memorable meeting held on the 19th of November. Not the least of these was the healing of the breech between Willis Polk and B. J. S. Cahill.

"These two architects, who were close friends for many years, fell out on the question of the Civic Center issue of 1909, when Polk so ably championed the Burnham plan and Cahill opposed it with a scheme of his own.

"On the occasion in question Mr. Cahill read the principal paper of the evening, and Mr. Polk very handsomely expressed his appreciation. As the paper read by Cahill was a plea for peace in the Chapter it may be said, therefore, to have borne immediate fruit."

Engineers and Architects' New Officers

The Engineers and Architects' Association of Los Angeles have elected the following officers for 1915: Samuel Storrow, president; A. H. Koebig, first vice-president; W. A. E. Noble, second vice-president; Arthur S. Bent, J. J. Backus, A. C. Martin and Kenneth Shively, directors.

The association is interested in a proposed bill to be submitted to the next legislature, to govern expert testimony in civil and criminal cases.

Prospects for Architects

Castroville, which is a growing town on the Southern Pacific Coast line, near Salinas, is to have a new bank building, and it is said officials of the First National Bank of San Francisco are interested in the project. No architect has been selected.

Redwood City Supervisors have bought a site for a County Jail. No architect has been selected as yet.

An addition of two wings for jail purposes to the County Courthouse at San Rafael is proposed by the Supervisors.

The City Trustees of Porterville have taken up unofficially the matter of constructing a City Hall to house city officers, jail and fire department. A building that will cost about $25,000 is contemplated. No architect has been engaged.

Oakland is to have four branch libraries. The architect for only one of these buildings has been selected. He is W. H. Weeks. Architects for the other buildings will be selected shortly.

According to the Hawley Investment Company, Syndicate Building, Oakland, H. S. Crane of Turlock, has purchased a lot, 85 feet frontage on Broadway, near Twenty-first street, Oakland, upon which the owner will erect a store and office building. No further details are available, and so far as known no architect has yet been selected.

Another real estate deal of importance has just been closed by Myers & White of that city. The building on Thirteenth street, between Franklin and Webster, now occupied by a furniture house, has been bought by a capitalist who will convert it into a modern office building.

Samuel T. Bryer of Gerson & Bryer, 126 Bush street, San Francisco, chairman of the Building Committee of the Commercial Travelers' 1915 Congress, stated recently that while the committee has the plans of a number of architects under consideration, no architect for its proposed home has been chosen, nor will there be one named before February 1st. The building is to be erected on Polk street, south of Hayes, and is to cost $50,000.

Mr. Meyer Gets Important Commission

Architect Frederick H. Meyer of San Francisco has been commissioned to prepare plans for a new school building for the Cogswell Polytechnic School at Twenty-Sixth and Folsom streets. One or more buildings will be included in the improvements, and about $130,000 will be expended now with the possibility of a larger sum later on. Construction will be Class C.

More About Palo Alto School

Architects Allison & Allison of Los Angeles are making good progress on the plans for the new high school at Palo Alto. It has been decided to build a group of four buildings, each one and two stories in height and they will be constructed of interlocking tile, faced with brick, terra cotta and cement. It is the intention to complete preliminary plans at once, so that a bond election can be held to vote the necessary money required to put up the buildings.

There is some talk of contesting the appointment of Architects Allison & Allison on the ground that the board has violated the provisions of the old State law of 1872, which requires the selection of an architect by competition.

Another Large Building for Julia Morgan

In addition to designing the new Y. W. C. A. building at San Jose, to cost $100,000, Miss Julia Morgan of San Francisco has been commissioned to prepare plans for a hotel to be erected in San Francisco, and to be the headquarters of young women who come to the Panama-Pacific Exposition. Money for this building is being subscribed by local associations throughout the country. A Class C structure three or four stories in height will be erected.

Sacramento Wants a Civic Center

The City Plaza of Sacramento, opposite the City Hall, will become the nucleus of a Civic Center, upon which will be erected the new City Library, a Municipal Auditorium, a Central Fire Station and, if possible, the Crocker Art Gallery. It is hoped soon to start work on the new library building, for which the Carnegie Corporation has offered to provide $100,000.

Tacoma Society of Architects

The December meeting of the Tacoma Society of Architects was given over to the study of the Panama-Pacific International Exposition. The meeting, which was led by Earl N. Dugan, was the first of a series as outlined by the program committee, at which different subjects of an educational nature will be considered.

* * *

The Tacoma Society of Architects recently elected the following officers: C. F. Mahon, president; George Gove, vice-president; H. A. Bell, secretary and treasurer, and Luther Twichell, moderator. The council of the society is composed of the president, secretary and moderator. A program is being formulated for each monthly meeting throughout the year.

San Francisco Architects Meet with Los Angeles Chapter

A delegation of architects from San Francisco, consisting of Messrs. William Mooser, William B. Faville and Edgar A. Mathews, met with the Southern California Chapter of the American Institute of Architects, on Saturday evening, January 9th. President Albert C. Martin presided.

An interesting talk on the San Francisco Exposition was given by Mr. Faville of the firm of Bliss & Faville. He stated that the exposition buildings will contain an area of sixty-five acres under roof. The Chicago and St. Louis expositions had one hundred and seven and one hundred and twenty acres respectively. The architectural commission decided to limit the area at San Francisco to sixty-five acres, in opposition to the desire of other exposition officials, because San Francisco is located on the extreme western edge of the country in a thinly settled district as compared with either Chicago or St. Louis, which are the centers for a population of millions. Extremely interesting was his description of the method used in coloring the concrete and plaster used in the construction of the buildings and colonnades by which these structures will not have the appearance of being recent creations but the look of newness will be worn off and they will give the impression of having been erected fifty years ago. This effect is also aided by the wind and fog. The architectural commission was given twelve million dollars with which to achieve the remarkable results attained. The Chicago commission had eighteen million dollars, which would be equal to about twenty-five million today.

Messrs. Mooser and Mathews addressed the members on matters of interest to the profession, outlining some of the experiences of the San Francisco and other chapters in the conduct of their affairs.

The board of directors reported that Mr. Garrett Van Pelt of Pasadena, had been elected to membership. The question of holding an architectural exhibition in Los Angeles this year was discussed. It was the consensus of opinion that if an exhibition was held it should be strictly and distinctly architectural and under the jurisdiction of the Chapter. Mr. Henry F. Withey was appointed chairman of the committee with the privilege of naming his own assistants.

Is This Law Constitutional?

Work on several buildings in Phoenix and other parts of Arizona recently has been stopped on account of Arizona's new 80 per cent law which was passed at the last election. The law provides that 80 per cent of the workmen on any job must be American citizens. Proponents of the law are out to see that it is obeyed and the contractors in desiring to abide by the act, have been informed by their attorneys that in discharging their foreign laborers in order to favor others, they might become liable for violating treaty rights of the United States with other nations. The constitutionality of the law will be tested at once.

Competitions for Buildings at Salem, Massachusetts

A considerable sum of money has been set aside by the Salem authorities to assist in various ways those who are desirous to rebuild in the burnt district. This fund is in the hands of trustees constituting what is known as the Salem Rebuilding Trust. Desiring to improve in the most comprehensive manner a certain tract of land within the burnt district, the Salem Rebuilding Trust invites architects generally throughout the country to participate in two competitions: one to secure the maximum housing possibilities on the lot, the second to secure sketch plans for a four-story apartment house. Two prizes of $100 and $75 will be offered to the designs placed respectively first and second in each. The plans will be judged by the trust with the assistance of C. H. Blackall, advisory architect to the Salem Rebuilding Commission. Architects who care to take part in these competitions are requested to communicate at once with the Salem Rebuilding Trust, Peabody building, Salem, Mass.

To Remove Dome

The Los Angeles Municipal Art Commission has reversed its former decision and now recommends that the dome of the branch City Hall at San Pedro be removed and replaced with a water-tight roof. The finance committee of the Council recommended that the building department be instructed to proceed at once with the work. The dome had developed many leaks and the city officials appear to have been in a quandary as to how best it might be fixed without a great expenditure.

Hollow Tile Residence

Architect Elmer Grey of Los Angeles has taken bids for a two-story basement and attic residence to be built at Coronado Beach for Gale Thompson. Schmidt Garden & Martin of Chicago are the architects. The house will contain about fourteen rooms in addition to a large hall.

Granted Certificates to Practice

At a meeting of the California State Board of Architecture, Northern District held on December 29th, 1914, the following were granted certificates to practice architecture:

Erle J. Osborn, San Francisco.
F. A. Sandford Foale, Sacramento.
William Koenig, San Francisco.

Reviews of Recent Books

of Interest to the

Architectural and Engineering Professions

By CHARLES HENRY CHENEY

EARLY AMERICAN CHURCHES. By Aymar Embury II.

This book will appeal to all architects who desire to understand and know the real Colonial architecture with more insight than just measured drawings can give. Written by a practicing architect of rare ability, the volume contains 102 photographs of the interiors and exteriors of practically every American church of the Colonial period which is of architectural interest or historical association. As the author says: "To the architect the principal interest in these old buildings is, of course, their forms, in which were expressed the supreme efforts of the artistic genius of our ancestors, the designers of the Colonial period, who were inheritors and practitioners of a concrete and perfected tradition such as does not even today exist. Their furniture, their dwellings, and their public buildings were all products of the same genius and the same ideal, and today we are seeking and finding in them sources of inspiration no less satisfactory than the best that Europe has to offer."

Published by Doubleday, Page & Company, New York. $2.80 net.

TRANSACTIONS OF THE LIVERPOOL TOWN PLANNING AND HOUSING CONFERENCE, 1914. Edited by S. D. Adshead and Patrick Abercrombie.

This volume ably presents to our American gropings after real city planning and housing the other side of the subject as it works out in execution. The English Town Planning Act of 1909 has now made compulsory careful planning with relation to the future, of all physical changes in English cities. The discussions at this conference cover practically all sides of city planning, still only in the educational or promotion stage in most cities of the United States. The questions taken up show an interesting balance between schemes for the handling of traffic, housing, restrictions, garden suburbs, with methods for most equitably paying for these improvements. This is indeed a book for practical City Planners.

Published by the University Press of Liverpool. 7s 6d net.

VILLAGE IMPROVEMENT. By Parris Thaxter Farwell.

While written primarily for the country village, this book, by the Chairman of the Village Improvement Committee of the Massachusetts Civic League, will be of great interest to all district and city improvement clubs and to all those lending their efforts to organize public committees for civic betterment of any kind. The great difficulty found in making the work of such organizations effective can only be overcome by the guidance of such simple books as this, which seems to cover practically all the subjects of improvement work before the public today.

Published by Sturgis & Walton Co., New York. $1 net.

STEEL CONSTRUCTION. By Henry Jackson Burt.

A small, practical pocket book, well illustrated with tables, for the use of the profession in office building construction. It seems to cover this phase of steel construction very fully, including several points not ordinarily found in hand books, such as wind bracing and the design and construction of built-up girders.

Published by The American Technical Society, Chicago. $2.75.

CARRYING OUT THE CITY PLAN—The practical application of American law in the execution of city plans by Flavel Shurtleff, in collaboration with Frederick Law Olmsted.

Widespread interest in city planning has found stimulation in very complete literature on the aesthetic, engineering and social aspects of the problem. We find this volume a sane and practical guide, calculated to aid those who are striving to bring about practical efficiency in the carrying out of the city plan.

While there has been no attempt to compile a comprehensive digest of laws or an engineering treatise on city planning, the book is legally sound and the authors, both notably well equipped for the task, have very comprehensively pointed their conclusions, and rendered a signal service to all who are interested in the physical development of their home city.

Published by the Survey Associates, Inc., 105 East Twenty-second street, New York. Postpaid, $2.

ETCHING—And other Graphic Arts, by George T. Plowman.

While primarily a practical treatise on Etching, the book is of value to all those who are in any way interested in the graphic arts.

The author, trained under that master craftsman, Sir Frank Short, has endeavored to answer all those technical questions which naturally arise when studying the various methods of artistic expression in black-and-white.

In two parts, the book covers first, those subjects necessary to a complete understanding of etching as a guide to the beginner; while later we find a most comprehensive and readable treatment of the whole field of the graphic arts. Both the beginner and more experienced, will find the volume of valuable service, and of real charm in its illustrations in etching, half-tone and line.

Published by John Lane Company, New York. $1.50 net.

Other Books Received

Country Houses, by Aymar Embury. Doubleday, Page & Co., New York. $3. (Review later.)

Bill's School and Mine, by W. S. Franklin. Franklin, Macnutt & Charles, South Bethlehem, Pa.

Build Now!

Editor The Architect and Engineer of California:—The present time offers a most favorable opportunity for your publication to inaugurate a vigorous campaign advocating the immediate start of building construction. Not in many years has been offered such a favorable time for economical building. Prices of materials are low and labor is plentiful. Contractors are not busy and are figuring very closely.

There seems to be no question but that the coming spring will see a decided business revival. At that time, new buildings will be required to take care of the increased activities. If these buildings are to be ready for occupancy in the spring, they must be started now. Further than this, the cost of construction is sure to increase with returning prosperity, so that the business man who delays will not only be hampered for space, but will undoubtedly have to pay more for his building.

In conducting a campaign of this kind, your publication will be rendering a distinct service not only to yourself and your readers, but to the building world and general public as well. You are giving owners valuable advice; you are increasing the activties of contractors, material manufacturers and labor generally; you are materially assisting the prosperity of the country, by promoting one of its largest basic industries, building construction; you are advancing the best interests of your own magazine by opening up a larger field for subscriptions and by stimulating a desire for more advertising among the manufacturers.

We believe that you cannot conduct this campaign too vigorously, nor devote too much of your reading columns to it. Perhaps it might even be worth while to adopt some such slogan as "Build Now and Save Money—Material Is Cheap, Labor Plentiful, Contractors Not Busy. Prosperity Coming!"

S. M. Fecleheimer.

A Los Angeles Competition

The problem of providing the best possible habitationes for the unskilled wage earners at a minimum cost is one of the questions now receiving earnest and careful attention in every large city in the country. Los Angeles has a problem peculiarly her own and this the Housing Commission has been making strenuous efforts to solve.

With this object in view the commission is offering prizes for designs and plans for house courts for unskilled wage earners which will afford all necessary comforts and conveniences to the occupants and at the same time return a small profit to the owner. The program for the competition has the approval of the committee on education of the American Institute of Architects. It is open to any architect or draftsman. Plans will be received up to noon, March 11th.

The awards will be made by a jury composed of two members of the Housing Commission of the city of Los Angeles and an architect. The jury will make the awards within thirty days after the competition is closed. Further particulars may be obtained by addressing Los Angeles Housing Commission, City Hall, Los Angeles City.

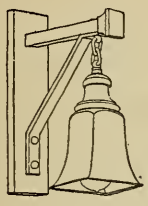
Pasadena City Engineer Dead

Lewis Eaton Smith, city engineer of Pasadena, died December 18, after a lingering illness. He had been in ill health for the last two years. Mr. Smith was a member of the Engineers and Architects Association of Southern California. He graduated from Stanford University civil engineering department in 1904 with the degree of B. A.

Personal

Sylvain Schnaittacher, architect, announces the removal of his offices from the First National Bank Building to 233 Post street, San Francisco.

Mr. Winsor Soule, architect, announces that the firm of Ray & Soule has been dissolved, and that he continues the practice of architecture at 1206 State street, Santa Barbara, California. He would be pleased to receive manufacturers' catalogues.



Heating and Lighting

Plumbing and Electrical Work

The Electrical Contractor

By C. F. BUTTE*

I have been requested to talk to you from a contractor's point of view, and I have taken it for granted that I may take my views with the aid of a wide angle lens and a telescope and touch on many angles and phases of the contractor's daily work, both at close and distant range.

The subjects, some thirty in number, which I will take up bear more upon the daily work with which each of us come in contact, while carrying on our business and will cover subjects our association has at times taken up and information which may prove of value to many of us. No matter what subject is discussed before you at these meetings, no matter what subject or actions an association may take, no matter what efforts may be spent by individuals, unless such actions or efforts result in one thing when applied to our business, namely greater profits, such actions or efforts are not a success. No matter how large or how small any business may be, it cannot be successful unless a profit is shown on the work undertaken, whether it is an order or contract amounting to one dollar or ten thousand dollars.

Only through efforts such as have been made at meetings of the character of today, can we obtain the desired result. Information disseminated through such talks as we have heard, data and tables will be of inestimable value to the electrical contractor, who is supposed to know all branches of the electrical business. He is supposed to know the various contract forms of all the power companies, the class of services in all parts of the city, must be familiar with every appliance, device or fitting made by all of the many manufacturers, some ten thousand or more in number, must know where to get the proper materials, must know the many rules and regulations of the National Underwriters and local departments, as well as the idiosyncrasies of the different local inspectors, must understand the many methods of building construction, must understand and interpret somewhat indefinite and indifferent plans and specifications and agree to furnish all items and materials essential, whether specified or not, must be a good judge of workmen and workmanship, must be able to correctly test and report and give advice on motors, generators and electrical machinery, and be willing to give bids to correct any fault or damage and back up his judgment with his capital by spending money for labor and material to correct the trouble and from the time he starts until he stops the contractor is "going some." In fact, the contractor must be like the widower who married a widow and had to decide why his six boys and her six boys were fighting their six boys. It therefore behooves all of us to gather as much knowledge and advice through associating with one another as possible.

The four subjects paramount to all other subjects in any contractor's business, are: Proper estimating, getting the business, a proper cost upon completion of work, and the collection of the bills. All other parts of our business or in fact of any business are incidental to these four subjects.

Proper Estimating

Estimating properly is something overlooked by many contractors and indeed seems to be the most vital question we have to handle. The fact that a considerable variation may exist in bids that may be submitted on a contract, does not always indicate that some error has been made by the estimator, however wide the variation may be, but it shows that some differences in interpretation of the plans and specifications exists, it indicates that some vital factors in the handling of the business are unbeknown to the estimators, it indicates that some estimator is forced to get the contract to hold his job as an estimator, it indicates that there may be some angel backing the concern and the manager makes one job cover up the loss on the other as long as the angel's wings can be clipped, it indicates that some preference is given or that a joker exists in the specifications, it indicates that a standard is sorely in need for estimating purposes, a standard not only in the method of estimating, but a standard for materials, a standard

*Mr. Butte is a member of the Butte Engineering and Electric Company of San Francisco. This paper was read before the State convention Electrical Contractors and Dealers' Association, and will appear in this magazine in two installments.

for quality, a standard for construction. This question leads us also to the point of standardizing specifications. There may be no question what class of material a specification may call for, but, does the specification cover quality in all respects? Uniform, concise, definite specifications and specifications that are complete would certainly rectify many of the evils of estimating existing at the present time and would mean that all competitors who figure and bid on the work covered thereby, would know exactly what is wanted, how the work must be done and therefore, would base their estimate on the same class and character of work. Unquestionably, the many varied bids now prevailing in the award of a contract would be reduced and more uniform and better conditions would prevail could this ideal condition be obtained in the writing of specifications. Not only would we be benefited as stated before, but we would also know what we should prepare for in advance of receiving any contract; our stocks of materials could be handled more economically and better, our standards of constructions could be more readily grasped by our men, thereby raising their standard and efficiency, our bulky detail work could be reduced and in many ways our efforts and work reduced, thereby increasing our profits without increasing our costs. A condition of this kind can never be obtained by individual effort, but must be carried on continuously by the concerted effort of all association members, each and all working collectively and individually through their association.

Many of the leaks, many of the mistakes and many detrimental contracts would be avoided and stopped by a standard specification and many charges to experience would be saved the contractor, again showing a profit. Furthermore, a standard specification would raise the quality of the work, as it is human nature collectively to standardize the best and not the poorest. We also find many specifications that are practically excerpts from the code in addition to the clause that the work must comply with the N. E. C. and local rules, while frequently these same specifications are very indefinite on points that should be fully covered. This lack of definiteness is liable to furnish a contractor reasons to bid on inferior work, such as ordinary plug cutouts instead of panel boards and switches, wood planking for main switchboard and many items of this kind, as long as it will pass inspection.

The education of the public in demanding and using standard electric materials and wiring would aid greatly to the adoption of standard specifications, as it is a fact that the public is our consumer even though dealing through an architect or engineer. We may say that the real cause for lack of a standard in specifications is the ignorance of the layman regarding the difference in quality of materials and work, as most of it is concealed when they see it, and as long as the lamp brightens, even if not up to full candlepower, they believe the work is well done. In contracting for other things and in the purchase thereof the average citizen seldom considers lowest price, but generally considers quality. Brown could buy a suit of black cloth for $12.50 but, does he not pay $25.00 instead, as it is of better quality? Is it not reasonable to presume he would do the same if he knew something about the quality of electrical materials? The time that it would require to educate the public to this point may take longer than we could claim on this world, but let us endeavor to educate the architects and engineers to this point assiduously and hasten the termination of chaotic conditions.

A standard for materials of equal quality although made by different manufacturers would aid greatly towards obviating unpleasant arguments with owners and architects. A standard of this kind would also correct the chaotic condition of our stocks, as we now have many brands of the same thing on our shelves.

The contractor is not entirely free from blame for any chaotic conditions that may exist at the present time, as many contractors could not be depended upon to recognize quality for materials and construction, but rather than lose a contract would base their bids on inferior and poorer construction and materials.

Another deficiency prevalent with our fellow members and competitors, and which seems a common fault with all of us, is the lack of importance given to the consideration of items of expense and unproductive labor costs, that enter into our costs to carry on our business.

The items that constitute overhead expense are many. In brief, any expenditures in salaries, rents, light and power, stationary telephones, cartage charges, stock losses and in fact any expenditures that cannot and are not charged directly to the costs of your work should be considered as overhead expense. The following lines will vividly convey the necessity of knowing something about your overhead expense and the application of your knowledge in your work.

Of bookkeeping I knew nary a line,
Of credits and finance the same;
But still, I went into the business
Of wiring—a wonderfully easy game.

I never considered such trifles as rent,
And taxes and insurance, thought I,
Were small considerations after they
were spent—
My profits would show bye and bye.

What knew I of overhead expense,
Or of the items of which it was made?
They told me it was at least 34 and six-tenths,
The monthly amounts which I had paid.

There were thirty-nine reasons all together
Why I failed and was put on the "run,"
The thirty-ninth and most important was—
I should never have begun.

Getting the Business

Initiative is unquestionably the keynote and answer to getting the business. We only need to look around a wee bit to see that this one word explains the success of all our successful business men, all of our great workers, all of our great inventors, and all of our great men. Can we not trace the wonderful work of Thomas A. Edison to initiative? Was not the great work of George Westinghouse due to initiative? Is not the success of any of our great business concerns of the present day due to initiative? This one word will explain how to get the business and no matter how brilliant a man may be, no matter what capital may be available, no matter what resources or qualifications may be commanded, if initiative is not combined therewith success cannot and will not be obtained. This world will not and does not want at the pinnacle of success any man who does not do the right thing at the right time without being told. The world only bestows its big prizes, honor, money and success, for this one thing—initiative.

Service is another quality essential for getting the business. While this word is undoubtedly overworked, the action unquestionably is underworked.

Service to your regular customer even though he may not have an order at the time, but wants to know about something that you should know about, is an item frequently neglected. Service means to get your men at the job at the hour promised and when the job is completed it will be the job done and not the customer. Service means to be prepared for any emergency that may arise, and to be able to handle any matters pertaining to your business without delay. Service means to have men available by rearranging work on hand to take care of any urgent case, and give your customer power or light with least possible delay.

Frequently one hears of other branches of the building industry calling upon a contractor to take care of certain work at once and when the men arrive at the building the work cannot be done for several days hence. Do you know why this occurs? The writer has investigated several of these cases and invariably the same reply is given, "You electrical contractors are always a couple of days behind in your promises and for this reason we call up beforehand to be sure the men will be on the job in time."

Fellow-contractors, we must correct our own faults before we can correct the faults of other branches of the business and profession. In many ways you can show your old customers and prospective customers through accommodation and service, that their orders and business should be handled by you, and with initiative and progressive actions you undoubtedly will succeed in landing many orders and contracts.

Service is also a vital factor in obtaining proper costs in your work, service in handling your materials, service in furnishing the necessary tools, and service in furnishing your men with the proper information, plans and working layouts. Do you all realize the labor lost unnecessarily by the starting and carrying on your work with insufficient information and working layouts? Can you expect your men to work efficiently, economically and rapidly if they must ravel into a set of plans consisting of many sheets each time they start a run of conduit? Can you expect your men to complete the work within reasonable time, if they must stop and start on the same parts several times on account of lack of detail?

Do not always blame the man who performs the work when the labor costs on your work is high. First investigate and discover the reasons therefor, and possibly it may be on account of delinquent service over which the man had no control. I say "over which the man had no control" for the reason that service enters in a considerable degree into the work the men perform over which the man has control. Can you believe that the average man uses only ten per cent of his brain cells and ten per cent of his physical powers? This average was deducted after careful research over a long period by the late Professor James of Harvard. The statement made is possibly very startling, however, is it not true that man's failure can be traced to mental and physical inefficiency and lack of power to concentrate and apply the qualities that he may possess? Have you not heard of men who are efficient when working for one contractor and inefficient when employed by another? The reason is human inefficiency, either on the part of the employer or employee, and should be overcome by the development of human efficiency. All these factors enter into the costs of your work and are vital to all of us, as our profits depend upon our costs when contracts are completed.

The material item is also a vital factor in your ultimate cost, not only in the sense of purchases, but also in the manner in which it is handled, supplied and delivered to the work.

The shortage of material on your work is an evil for which there is absolutely no excuse. However, you must admit that such shortages do exist. I do not include materials that are required for alterations or changes made in the work as it is underway, but materials which you knew about before the work was started.

(Concluded in the February Number.)

Height of Sinks

A prominent architect in New York recently wrote to an industrial paper:

I wonder whether or not your attention has ever been called to the growing dissatisfaction among women, who are the most frequent users of these fixtures, especially of kitchen sinks, with this "standard height," and to the fact that such architects as are awake to new ideas are more and more specifying that these fixtures be set higher than thirty inches, generally thirty-four or thirty-six inches?

Women have strained their backs for years over low kitchen sinks, but are now rising in protest against a practice which is almost criminal in its indifference to the comfort of those who are forced to lean over when they might just as well stand straight. I presume it will be a generation before all the old sinks have been changed, but I sincerely hope it will not take that length of time to convince all the plumbers and plumbing supply houses that thirty-six inches is better than thirty for the height of sinks and lavatories, and that washtubs, too, as a rule, have been set too low.

Klimm Opposes Sanitary Device

Frank J. Klimm, a San Francisco plumber-contractor and member of the City Board of Health, has succeeded in getting the Board to withhold its approval of a meritorious sanitary combination bathtub, manufactured by the Improved Sanitary Fixture Company of Los Angeles, where nearly 300 of these tubs are in use and have been pronounced highly satisfactory. The fixture saves the owner quite a little "roughing in" expense and naturally the plumbers are opposed to it. It is likely the tubs will be installed in San Francisco just the same, and the courts will be asked to pass upon the matter.

Safety First

A concern that can put up a certified check for $350,000 (as the McArthur Bros. Company did in the Twin Peaks Tunnel contest), must be ranked with the "Big Fellows."

The McArthur Bros. Company have a record extending over 86 years for accomplishing great engineering feats and such enterprises as the Erie canal, the Chicago Drainage canal, Sault Ste. Marie Water Power canal, the Massachusetts dam for the city of Boston, the Katonah dam for the city of New York, the Ashokan dam and reservoir for the city of New York, besides many hundreds of miles of important railroad systems of the country, all bear evidence to their engineering skill. As engineer constructors they are prepared to furnish preliminary reports, reconnaissance and surveys, plans and specifications, operation of property, estimates of cost, revenue and expense, construction and erection, record of costs, account statistics. An estimate of cost prepared by this company is based not only on ascertained engineering data, but upon a broad experience in the field as constructors. The importance of this feature will be appreciated by those who have financed enterprises where a combination of engineering skill and construction experience has not been utilized.

The McArthur Bros. Company controls and has at its disposal one of the largest plants of contractors' equipment in the country. This is always immediately available for work, thus assuring prompt execution of contracts.

The McArthur Bros. Company have offices in New York, Chicago and San Francisco.

Judson Manufacturing Company Now Operating an Open-Hearth Furnace

THE accompanying photographs show the latest enterprise of a Pacific Coast steel manufactory — an open-hearth furnace—of the Judson Manufacturing Company, one of the largest steel and iron firms in California. The increased demand for a fine grade of soft steel for merchant trade, manufacturing, wagon-making, etc., convinced Vice-President French that the Coast offered a field for a home product, and at no small expense the plant has been equipped with furnace and machinery for turning out mild steel bars, small angles and universal plates in the same range of sizes as it has heretofore supplied in double refined iron. By the open-hearth process the ingots are bottom poured, according to the latest practice of steel making. It is claimed the product equals in every particular that heretofore brought from the East and is sold on a strictly competitive basis with the Eastern product. No doubt the Judson company will find a ready market for its new product; in fact, Mr. French says the capacity of the furnace has already been reached.

In connection with this new departure it is interesting to note that the plant was designed by one of the foremost open-hearth engineers in the United States—Mr. S. T. Wellman of Cleveland, Ohio, who has probably designed more plants of this type than any other one engineer in the world. The Judson plant is in charge of Mr. H. W. Lash, for many years general manager of the Carbon Steel Company of Pittsburg, and recognized as among the best in his line in this country.

TWO VIEWS OF JUDSON MANUFACTURING COMPANY'S OPEN HEARTH FURNACES

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

The Brick Road and Its Construction*

By JAMES M. McCLEARY

(Continued from December Number)

Be careful not to injure your curbing during the later stages of construction. Careless hauling of heavy loads or machinery over an unprotected edge will cause breaks which expose the brick to abnormal wear. This caution has frequently been violated in my observation.

I would issue three warnings with respect to concrete bases; don't use concrete that is not homogenous; don't tolerate the existence of voids; don't be satisfied with a finished surface that is not uniformly smooth. In addition to these points, one should observe all the other cautions that apply generally to concrete mixing.

The value of the first and second warnings is apparent when you consider that the sole object of a foundation is to strengthen the natural bearing surface and transmit the burden widely and uniformly. The third caution is to prevent such projections or depressions in the concrete as shall result in a different depth of sand cushion at different points.

The importance of this feature will be apparent after the rolling of the brick surface is in progress. An undulating surface of brick means a sounding board effect when the pavement is brought into use and a possible breaking of the bond. Mere spreading of the sand is never sufficient. It should be rolled and re-shaped repeatedly until both the surface and the density are uniform. Too often the road builder contents himself with one rolling after which he fills the depressions with loose sand and finishes the surface with a template. Each refilling should be followed by rolling, a hand roller of 350 pounds weight being most satisfactory. A soft, uncompacted sand cushion will work up between the brick, when the latter are rolled.

In the culling of brick, good judgment is the exception. Many seeming defects, as viewed by the casual inspector, are not defects. The cull pile may well be examined for later decision on some of the brick that were hastily eliminated. Softness is the chief defect to avoid. Kiln marks frequently indicate unusually good brick, because they are due to fusibility and pressure from the weight of overlying brick in the kilns and fusibility means vitrification. Be sure that your brick are used their best side up. Delivery to the setter in such a position is recommended. Be sure that the lugs are all in the same direction. The purpose of the lug is to provide a uniform interstice and permit the grout to descend to the bottom of the brick. Laminations are not to be avoided. If you visit a brick plant you will see that the very process of making bricks entails the existence of laminations.

Don't begin your rolling in the center of the pavement. Roll adjacent to the curb first, approaching the center gradually. When the center has been reached, start at the opposite curb and repeat the process.

Good grouting, like charity, covereth a multitude of sins. No badly grouted pavement was ever a good pavement, but well grouted pavements have sometimes passed muster for considerable periods in

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spite of gross faults in other details of construction. Three successive applications of a one to one mixture of Portland cement and clean sand has been my rule. The utmost care in selecting materials, in applying the grout and sweeping it into the very bottom of the cracks will be repaid in results. Anything less than the most exacting care in the application of grout is just like throwing labor and material away.

We have roads now bearing a heavy traffic whose first cost is their last cost to date, although they have been down a decade or more. How many decades this state of affairs will continue is a matter than can be only guessed, for, as a government bulletin so aptly states, "no properly constructed brick pavement has ever yet worn out."

Cracks in Concrete Roads

In view of the importance of the fact that cracking of concrete roads is generally considered to be one of the most serious objections to them and the most difficult to avoid, the Municipal Journal expresses the opinion that sufficient attention has not been given by engineers and road-builders generally to the report of the committee of the National Conference on Concrete Road-Building concerning the contraction and expansion of concrete roads, based largely on investigations made by the U. S. Bureau of Standards.

One of the most important features of this report, as well as that which undoubtedly seemed the most novel to many, was the statement and apparent proof that not only does concrete expand with the absorption of moisture and contract as it dries out, but that this effort of temperature changes and may be sufficient to cause a stress in the concrete opposite to that which would be caused by a normal temperature change. Moreover this effect of moisture absorption and drying out apparently continues throughout the life of the concrete. It would seem to follow, therefore, states the committee, "that the condition that would provide for a decrease in moisture content when the temperature increases and an increase in the moisture content when the temperature decreases, would be an ideal one."

The experiments made also indicate that variation in the quality of the concrete will cause a variation in the tendency to expand and contract with change in moisture content, as dense mixtures absorb moisture less rapidly than porous ones. Consequently, if there are two qualities of concrete in a road existing either as a top and bottom layer or in two masses (such as two successive batches of slightly different mixture) occurring side by side, the more porous of the two would have a tendency to expand more than the other and consequently move a greater distance, result-

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ing in tensile stresses and possibly in shearing between the two masses of concrete. If the base of a two-course pavement is more porous than the top, the tendency would be for the former to expand and contract more than the latter and thus cause a separation of the two.

The above is the strongest possible argument for securing absolute uniformity in both proportioning and mixing, in order that not only all of the contents of any one batch but also all the batches in a given pavement, shall be as nearly as possible absolutely uniform in composition and homogeneous in structure. How far this is from realization in too many concrete roads is known by many engineers who have given the subject attention.

High Cost of Bidding

A report prepared by the Illinois Chapter of the American Institute of Architects upon the problem of estimating by contractors under the present methods, states that members of the Chapter investigated the office work of five representative contractors. They found that the average number of contracts estimated by each contractor in one year was twenty-two, the average number of jobs which he obtained from these estimates was ten. The average value of the time spent by the office force of each firm on each estimate, including additions by sub-contractors and material men, was $503. The report points out that the cost of six bids on a building costing between $100,000 and $150,000 ran to over $3,000, that is, between 2 and 3 per cent of the whole cost of the work. Perhaps in no other business today is so much unproductive work done at so high a cost.

Seattle Bricks Rejected

Fifteen thousand bricks, shipped to San Francisco from Seattle for the paving of Third street, have been rejected by the Board of Public Works, on the ground that they were not up to specifications. They were an old style brick, which, it is claimed, will not allow cement to run between them and hold them together.

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Safe Loads on Footings

A good method of deciding the safe load on footings is given in the following formulae:—

Divide the total load in pounds by the safe load in pounds per square foot; the quotient is the required area in square feet. The following values for the bearing power of soils given by Prof. Ira O. Baker, have been generally accepted.

Nature of the Soil	Bearing power in tons per sq. ft. Min.	Max.
Rock—the hardest in thick layers, (in native bed)	200	..
Rock—equal to best ashlar masonry	25	30
Rock—equal to best brick masonry	15	20
Rock—equal to poor brick masonry	5	10
Clay—on thick beds, always dry	4	6
Clay—on thick beds, moderately dry	2	4
Clay—soft	1	2
Gravel—and coarse sand, well cemented	8	10
Sand—compact and well cemented	4	6
Sand—clean dry	2	4
Quicksand—alluvial soils, etc.	0.5	1

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VIEW OF PLANT IN SOUTHERN UTAH

Some Notes on Keene Cement

By J. M. BICKEL*

ONE of the hitherto unsolved problems which has engaged the thought and attention of our leading architects throughout the world has been the question of finding a perfect material for plastering, wainscoting and decorating the inside walls of otherwise good, substantial residences and public buildings. The demand for such a product has now been fully met in the production of Bickel's American Keene Cement, which is being extensively specified and used by many of the best architects throughout the country.

After years of experimenting, the writer has succeeded in making a Keene cement that combines chemically with lime putty in such a way as to harden the lime. When used in the proportion of one-fourth or one-fifth of Bickel's American Keene Cement (Basic brand) with three-fourths or four-fifths of lime putty, together with the customary amount of sand, it makes a wall much harder and more satisfactory than any of the ordinary gypsum hardwall plasters. The mortar can be used any time within sixty hours after it is mixed. All the droppings can be retempered and used. It sets slowly and hardens slowly and does not corrode metal laths or studdings. It contains no organic matter and consequently has no bad odor. Neither does it deteriorate in stock, but can be kept for years without injury. When used in accordance to manufacturers specifications, under present trade conditions, the cost of a high-class Keene cement wall is no more than an ordinary hardwall plaster job.

Unlike other hardwall plasters, walls plastered with lime and Bickel's Basic Fine, American Keene Cement keep getting harder for six months or more after applied to the walls. The walls finally get as hard as marble, but during the setting and hardening process it has elasticity enough to prevent crazing or cracking.

Rooms plastered with this product are free from sounds and echoes that characterize rooms plastered with ordinary hardwall plaster. The acoustic properties in all buildings using this material

MR. J. M. BICKEL

*Mr. Bickel has been at the head of the American Keene Cement Company since its organization and has, with great care, worked out all the scientific principles involved in the production of high-grade Keene cement.

are perfect, thus making its use most desirable in schoolrooms, courthouses, theaters, churches, and in fact, all classes of buildings.

The Superfine brand for wainscoting, finishing, kitchen and bathroom work is unexcelled. Many of the best buildings in the Pacific Coast cities and throughout the country generally, finished in this material, bear testimony to its superiority.

Bickel's American Keene Cement, extra superfine and coarse brands for Scagliola and Imitation Marble has long been in great favor with artisans doing this class of work.

* * *

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This company has a commodious mill in Southern Utah on the D. & R. G. Railroad, adjacent to an extensive deposit of over two thousand acres of superior quality of Alabaster, aggregating over ten million tons. The mill is constructed of reinforced concrete, with steel trusses and steel roof, three hundred feet long, equipped with first-class machinery throughout, and has a capacity for making one hundred tons of Keene cement per day.

The mill has a thoroughly equipped laboratory in which the chemicals used in the manufacture of Bickel's Cement are prepared. These chemicals consist of commercial minerals suitably treated and compounded. This proposition has been worked out on scientific lines, conforming scrupulously to the natural laws indicated in the compounding of materials that results in the best cement that can be produced with sulphate of lime as a base, commercially known as Keene cement.

The company has a well-established trade in all the Pacific Coast and intermountain States and has also a considerable trade in Atlantic seabord and Mississippi Valley cities.

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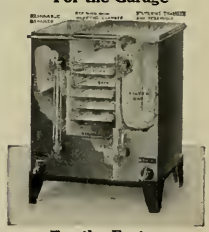

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Co-Operation and the Jarvis Oil Burner Company

ANY one who could have been present at the annual Christmas dinner given by the T. P. Jarvis Crude Oil Burning Company to its staff of workers on the afternoon of December 24th last, would understand the force of the above heading. It was the seventh event of its kind, having become an annual affair with a little something added each year. Everyone connected with the organization seems to think and act as if everything would go all wrong if he (or she) did not do their level best. The organization works along lines defined by Webster as "Working jointly to the same end," coupled, perhaps, with the latest Elbert Hubbard definition of the same word, "Doing what I tell you to do, and doing it d——m quick."

Everyone present was called upon to say something, and the responses were replete with Christmas cheer and well wishes for Mr. Jarvis and his associates. Mr. Jarvis outlined very clearly the past, present, and future policies of the company, and in the main they were plans of expansion and advancement in the manufacture of oil burners, vacuum plants and ice machines. He emphasized the fact of home manufacture, everything used being made in San Francisco, except the motors. This is worthy of the highest consideration for many reasons.

One employe in his remarks, argued that climatic conditions always played into the hands of the company, since cold weather called for more oil burners, and hot weather created a market for ice machines.

A significant fact, demonstrating the growth of the plant, was brought out in Mr. Jarvis' talk by his statement that the present pay roll is twenty times greater per annum than it was nine years ago.

One of the very convenient and efficient installations of the Jarvis Company is a combination oil burner and vacuum cleaner, set up complete as one machine and operated by the same motor.

Mr. Jarvis has several live agents in the interior of the State, and they are kept busy selling and installing new plants.

A very creditable list of oil burner installations made by this company follows:

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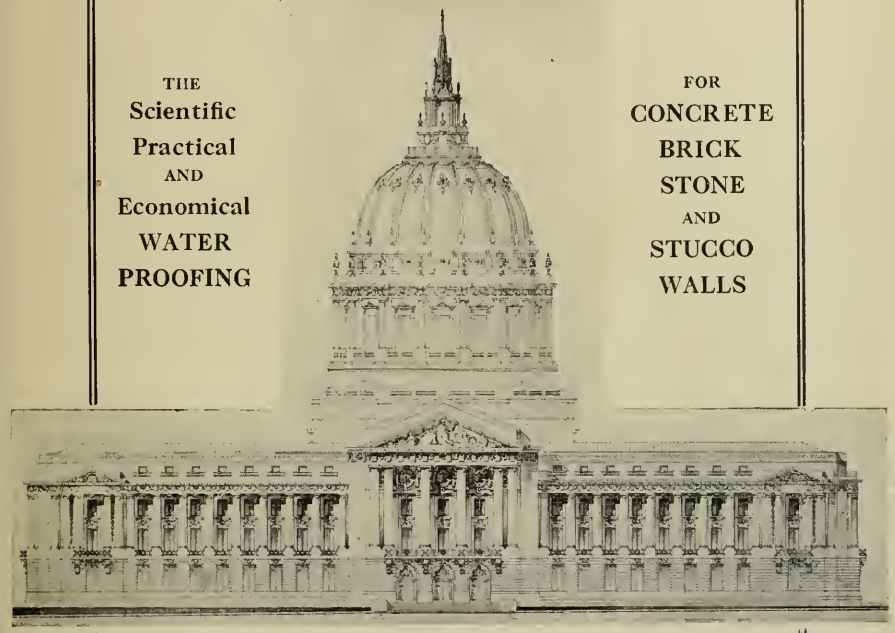

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Oregon Pine 1 x 4 T. & G. Flooring, No. 1, $31 per M; No. 2, $28; No. 3, $26.
Oregon Pine T. & G. Ceiling, No. 1 and 2 mixed, $26 to $28.
Redwood, Rough Common, 1 x 4 and up, $20.00.
Redwood, Rough Common, 2 x 3 to 2 x 10, $20.00 to $22.00.
Redwood Rustic, No. 1, $35.00; No. 2, $32.00.
Redwood Ceiling, No. 1, $29.00; No. 2, $26.00.
Redwood Shingles, No. 1, $2.45 full count.
Red Cedar Shingles, Star-A-Star, $2.60 full count.
Pine Lath, $2.40 per M.
Metal Lath, 13 to 25c per yd., according to quality.
1 x 3 Oak Flooring, Q. S. Clear, $120.00 per M; Select, $80.00 per M.
½ x 2½ Oak Flooring, Q. S. Clear, $96.00 per M; Select, $74.00 per M.
1 x 3 Maple Flooring Clear, $75.00 per M; Clear White, $105.00 per M.
White Lead in Oil, 8¼c per lb.
Dry Red Lead, 8c per lb.
Boiled Linseed Oil, 63c gal. Raw Linseed Oil, 61c gal.
Turpentine, per gallon, 63 to 70c in bbls.
Dry Shellac, 35c per lb., variable.
Hyloplate Blackboard, 25 to 35c per foot, installed.
Composition Flooring, 25 to 30c per foot, laid.
Genuine Slate Blackboards, 40 to 50c per foot, erected.

LOS ANGELES PRICES

Common Red Brick, No. 2, $4.50 per M.
Clinker Brick, $9.00 per M.
Pressed Brick, $35.00 per M.
Enameled Brick, $65.00 per M.
Red Roofing Tile, $12.00 and $15.00 per square (not laid).
White Cement, $6.00 per bbl.
Portland Cement, $2.30 per bbl.
Lime, $1.50 to $1.75 per bbl.
Hardwall Plaster, per ton, $9.90 ex. whse.
Oregon Pine, Rough Common, 1 x 3 up, $19.00 to $22.00 per M.
Oregon Pine, Rough Common, 2 x 3 up, $17.00 to $21.00 per M.
Oregon Pine Flooring, 1 x 4, No. 1, $40.00; No. 2, $35.00; No. 3, $22.50 per M.
Oregon Pine Ceiling, 1 x 4, No. 1, $36.00; No. 2, $31.00.
Redwood, Rough Common, $20.00 to $24.00.
Redwood Rustic, No. 1, $38.00; No. 2, $33.00 per M.
Redwood Ceiling, 1 x 4, No. 1, $33.00; No. 2, $28.00 per M.
Redwood Shingles, 4 bdls. to M, No. 1, $2.25; No. 2, $1.75.
Red Cedar Shingles, 4 bdls. to M, Star-A-Star, $2.75.
Pine Lath, 1½ in. x 4 ft., $3.25 per M; 1⅝ in. x 4 ft., $3.65 per M.
White Lead in Oil, 8½c per lb.
Red Lead, dry, 8½c per lb.
Raw Linseed Oil, bbls., 65c gallon.
Boiled Linseed Oil, bbls., 65c gallon.
Turpentine, bbls., 63 to 70c. gallon.
Crushed Rock and Gravel, $1.65 per yard.
Sand, 85c per yard.

SACRAMENTO PRICES

Common Brick, $7.00 per M, C/L.
Pressed Brick, Wire Cut, $30.00 per M, C/L.
Portland Cement, $2.40 per bbl. carloads.
Crushed Rock and Gravel, 65c per ton, ex. cars.
Sand, $1.00 yd. on cars.
Roofing Gravel, $1.50 per ton.
Lime, $1.35 bbl.
Hardwall Plaster, $13.00 per ton, ex. whse.

STOCKTON PRICES

Common Brick, $7.75 per M, del.
Face Brick, Wire Cut, $31.00 per M C/L.
Cement, $2.40 per bbl., C/L.
Crushed Rock and Gravel, 90c ton.
Sand, 90c.
Roofing Gravel, $1.50 per ton.
Lime, $1.35.
Hardwall Plaster, $13.00 ex. whse. per ton.

FRESNO PRICES

Common Brick, $9.50 per M, del.
Face Brick, Wire Cut, $35.00 per M, C/L.
Cement, $2.84 per bbl., C/L.
Crushed Rock and Gravel, $1.35 per ton.
Black Face Brick, $25.00 per M—F. O. B.
Sand, $1.00 per yd., del.
Roofing Gravel, $1.85 per ton.
Lime, $1.50 bbl.
Hardwall Plaster, $14.00 per ton, ex. whse.

BAKERSFIELD PRICES

Common Brick, $9.00 per M, del.
Face Brick, Wire Cut, $37.00 per M, C/L.
Cement, $2.77 per bbl., C/L.
Crushed Rock and Gravel, $1.80 per ton.
Sand, $1.00 per yd., del.
Roofing Gravel, $2.00 per ton.
Lime, $1.50 per bbl.
Hardwall Plaster, $15.00 per ton, ex. whse.

CHICO PRICES

Common Brick, $11.00 per M, del.
Face Brick, Wire Cut, $35.00 per M, C/L.
Cement, $2.65 per bbl.
Crushed Rock and Gravel, 85 to 90c per ton, C/L.
Sand, $1.00 per yard.
Roofing Gravel, $1.50 per ton.
Lime, $1.40 bbl.
Hardwall Plaster, $14.00 per ton, ex. whse.

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Partial list of recent installations of combination vacuum cleaner and oil burner equipments: Hotel Haven, San Francisco; Senate Hotel, San Francisco; Gartland Apartments, San Francisco; Glenarm Apartments, San Francisco; Armijo School, Fairfield, Cal.; Ellis Hotel, San Francisco; Hampshirearms Apartments, San Francisco,; Weber School, Stockton, Cal.

Eastern Writer Scores the Mazda Lamp

Mr. F. Laurent Godinez, a lighting expert, has an article in "Architecture and Building" that deserves to be read by men who believe in the conservation of human eye-sight. Mr. Godinez heads his article—which is the first of a series—"In the Glare."

"Indirect lighting, like any other application of artificial light, has its field of usefulness, but it is not unlimited," he says. "Whenever the architect takes hold of the lighting problem, about once in every 10,000 applications, we find lighting which, if anything, is visually safe. Glaring spots of light blot out pictorial expressions, just as splashes of white paint would destroy the effect of any fine painting. The architect knows this, but he is so beset and hounded by lighting salesmen, and so swamped and flooded with lighting literature, and so obsessed with millions of other annoyances that the big 'little' detail of lighting seldom gets the personal attention it deserves. Said a Jersey City architect who lighted a high school so that it is a menace to the eyesight of every student: 'I suppose it is bad, but the authorities (politicians and Board of Education) want a lot of glare, or they don't think they're getting their money's worth.' This allusion refers, of course, to conditions which could, and can be improved by the architect himself, and such cases are by no means restricted to school buildings. The bigger the undertaking the more miserable the lighting as a rule, and it is apropos to add that the new station of the New York Central Railroad, with its crude exposure of glaring bulbs in the approaches is no exception, excepting as a tribute to the stupidity of the illuminating engineer, and his ignorance of even the fundamental principles of physiologic lighting.

"But how about the condition which cannot be regulated by the architect? Millions of people ride in the subway and suburban trains, twice daily. The 'uneconomic' electric bulbs of the carbon type, have been replaced by 'high efficiency' mazda lamps, 'giving three times the light' (according to advertisements in the 5 cent weeklies) but with two hundred times the glare! (not mentioned in advertisements). These lamps are so glaring and dangerous to the eye that their exposure in the form of bare bulbs should be prohibited by law. Every architect is interested in getting facts, free from the graceful coloring of those subsidized writers who abound so plentifully nowadays and whose writings are a part of the advertising section. The question is one of Eyesight vs. Glaring Lights, and the issue is the eyesight of the next generation."

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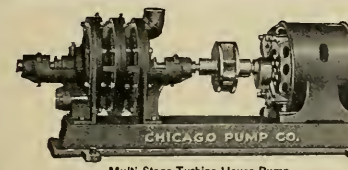

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Concrete Hardener Insures a Perfect Concrete Floor

The recognition of concrete as a permanent building material is so well established and its constantly increasing use is so apparent to the casual observer, it is not surprising, therefore, that the increased field for Portland cement has been anticipated in many ways. In order to give the subject proper and worthy attention, it is noted that a number of firms and individuals are specializing in the use of cement and its kindred materials.

E. A. Bullis & Company of San Francisco are among the first to specialize in materials for cement and include in their line Hardeners, Surfacing, Dry Mortar Colors, Waterproofing, etc. All these things are desirable and quite necessary under certain conditions.

For instance, regarding the hardener, it might be mentioned that the floors of a modern industrial plant, these strenuous days, are, or should be, among the most seriously discussed and planned problems before the architects or owner. The larger the output of the factory or the more business transacted inside the building, the more wear and tear the floor is subjected to, and the service and traffic it is called upon to withstand is very much greater than any other part of the structure. However, there has been of late a growing tendency on the part of architects and engineers to provide a floor surface designed to suit the requirements; and along with the floor problems comes the specialist who deals with just such cases, with the result that the time-defying properties of concrete are combined with the wear-defying cement hardeners—the two combined making a unit of great improvement.

So much has been said and written in favor of concrete floors in preference to wood that nothing remains of the problem except to make these concrete floors hard enough to withstand the traffic and render them sanitary, dustproof and waterproof. The pores in concrete are

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there by virtue of the materials that go into the making. Concrete will always be porous, will always granulate and have a tendency to crumble and break down under severe loads or constant wear. It is to overcome this that the specialist is called in and the floor is properly improved to meet the conditions.

In cases where it is desired to design a hard, tough floor of cement mortar, the use of Federal Steel Cement Hardener is suggested by these specialists. This is a finely ground metallic material composed principally of iron dust. The compound when mixed into the mortar oxidizes and expands, filling up and sealing the pores and increasing the tensile strength to a degree which makes the floor possible to hold up under severe wearing conditions. The following test supporting this claim for increased tensile strength was made in the testing laboratories of Messrs. Crowell & Murray, Cleveland, Ohio. This report is as follows:

Cleveland, Ohio, June 18, 1914.
The Federal Steel Cement Mills,
Cleveland, Ohio.

Gentlemen:—We give you herewith the results of the physical test on a mixture of standard cement, sand and your concrete hardener.

A mixture of standard cement and sand in the proportion of
100 lbs. cement
200 lbs. sand
was made into briquets. At the end of 7 days these briquets showed a tensile strength of 262 pounds. At the end of 28 days they showed a tensile strength of 342 pounds.

A mixture was then made of
100 lbs. standard cement
200 lbs. sand
5 lbs. of the concrete hardener
At the end of 7 days these briquets showed a tensile strength of 407 pounds, and at the end of 28 days a tensile strength of 546 pounds.

(Signed) Crowell & Murray.

This represents an increase in the tensile strength of 55 per cent for the seven day period and 59 per cent for the twenty-eight day period. It is the advent of such materials as this hardener which have called the specialists into existence, who in turn have succeeded in perfecting concrete by employing various treatments adapted to the conditions required.

Personal

Charles R. Meyers of New York, architect for the New York State Building at the Panama-Pacific Exposition, is in San Francisco, and is making his headquarters at the St. Francis Hotel. Meyers has prepared plans for a number of exhibit booths to be erected in the Palace of Education and Palace of Mines and Metals for various Eastern concerns.

The First and Last Word in Fireproof Doors and Trim

When the cave man first rolled a boulder in front of the entrance to his cave the *first* door was invented.

That door, crude as it was, possessed one virtue that the doors of civilized man did not possess up to the Twentieth Century — IT WAS FIREPROOF.

During the early part of the Twentieth Century man began to realize that the chief purpose of any door should be to oppose fire, *man's greatest natural enemy.*

This realization resulted in the invention and development of the **Dahlstrom Products** — the last word in fireproof doors and trim.

The Dahlstrom Products, which consist of hollow metal doors, windows, partitions, and all interior trim, possess not only the fireproof virtue of the cave man's door but they represent the utmost perfection in quality, finish, durability, sanitation, and withal are artistic and esthetic.

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Bank Interiors

H. H. Winner, for six years Pacific Coast manager for Weary & Alford, specialists in bank interior work, has severed his connection with that firm, and has established himself in the Nevada Bank Building, San Francisco, as the H. H. Winner Company, designers of bank interiors of the higher class. Mr. Winner has also reorganized the American Fixture Company and this concern will seek business in cabinet and fixture work. Mr. Winner has many friends in San Francisco and throughout the bay region. His native home is Ross, Marin county. Mr. Winner has recently completed plans for extensive alterations to the Bank of San Rafael. The entire building will be modernized and the banking rooms will be made to compare favorably with any of the big metropolitan banks. About $20,000 will be expended in the work.

Among the notable contracts supervised by Mr. Winner while Coast manager for the Weary & Alford Company are the Wells Fargo Nevada Bank Building, San Francisco, American National Bank, U. S. Grant Hotel, U. S. National Bank, all in San Diego; the Citizens National Bank in Riverside and the Union National Bank of Pasadena.

Santa Barbara Highway System

The Board of Supervisors of Santa Barbara has ratified the appointment, by the Highway Commission, of Haviland & Tibbetts of San Francisco, as engineers for the county highway system, and on the assurance that plans will be ready by February 1st, decided to postpone the proposed bond election for bridges, so that all propositions may be submitted at the same time.

Standard Varnish Works at the Panama-Pacific Exposition

The Standard Varnish Works, with a Pacific Coast branch at 113 Front street, San Francisco, will have a very unique display at the Panama-Pacific Exposition. They will not only show local woods finished with their products, but have secured woods from all over the world upon which will be displayed the results that can be obtained with Standard varnishes, stains and enamels. Their Satinette, the famous white enamel, as well as Kleartone stains and Elastica, will be largely in evidence. They will also have a display of fosil gum from which varnishes are made.

As an evidence of the popularity of Standard products it is estimated that fully ninety per cent of the varnishes and enamels used at the Fair are of this manufacture. Architects, painters and builders are extended an invitation to make this booth headquarters while visiting the Fair. From an educational standpoint no architect should fail to visit this display.

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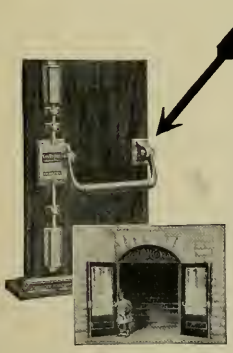

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In "Sweet's Index," Pages 770-771

America Excels in Bells and Chimes

THE war in Europe has already taught a multitude of our people in this country a very useful lesson, which could well be taken to heart by all. Many previously imported goods have become displaced by American made products and with astonishingly satisfactory results, demonstrating as perhaps no other condition would that American made products are equal and in some respects, superior to those made abroad, and what is more effective to the welfare of our country is that the industries thus affected are and by right should be supported by our purchasing power, which advances our industrial condition as a nation.

Among the manufacturing industries of this country there is one that is unique in its way and an art in itself—the manufacture or founding of church chimes, peals and bells, an industry that appeals to the highest and noblest of our emotions and to which the artisans employed therein give their best thought, skill and energy. In this industry the McShane Bell Foundry Company of Baltimore, Maryland, ranks without a peer, as their bells are patterned and proportioned in accordance with the principles embodied in the best-known foreign products.

For many years American-made chimes have been modeled on lines where as little metal as possible has been used to produce the lowest pitch notes. It has remained for the McShane Company to reverse this tendency in an endeavor to have their chimes composed of bells of the fullest practicable weight of metal for the desired tones, more particularly for the bells composing the upper half of the chime, and their efforts have met with signal success.

In many (and we might say, practically all other American-made chimes), the bells comprising the upper half of the chime sound as though they were pitched in the next upper octave, and appear shrill and uncouth in comparison with the lower half. This detriment has been overcome by the McShane foundry to the great satisfaction and delight of the purchasers.

While the fullest practicable weight has been patterned into the bells for the required notes, the tuning and tone-temperament have been equally predominant features, achieving a wonderful standard of excellence. The previous unpleasant effects resulting from a combination of rich lower tones with light, thin upper tones above the fourth or fifth bell, respectively, have been eliminated. The McShane Company has obtained an equalized tone of richness and smoothness that has astonished the most eminent and able judges of bell and chime tones. Their personal inspection of the company's facilities and scientific appliances for turning out the finest work possible in chimes and peals convinced them that better chimes can not be obtained anywhere.

In the firm's new plant, just completed at Baltimore, all possible care has been exercised to install therein the best and most complete appliances, together with scientific instruments to assure the production of not only the highest quality, so far as materials used in the composition are concerned, but what is more important—the most perfect musical results that human thought, scientific research and skill can produce.

Praise for Concrete Construction

The recent fire in the factory of Thos. A. Edison, Inc., West Orange, N. J., proved a particularly severe test on the concrete buildings. The absolute fire proofness of the concrete construction and the error in not having used steel sash are confirmed in the following newspaper interview with Thos. A. Edison:

"The big lesson of this fire has been the value of concrete construction. My buildings are gutted but there they stand, ready for refitting. One error revealed was in not using steel window sash and trim and wired glass that withstands great heat. We will certainly have to use that finish henceforth. My good friend, Henry Ford, tells me that all of his automobile factories have this steel trim and wired glass."

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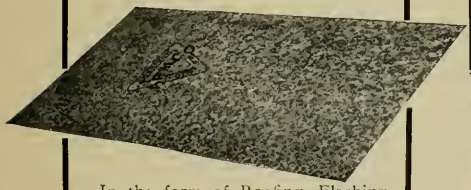

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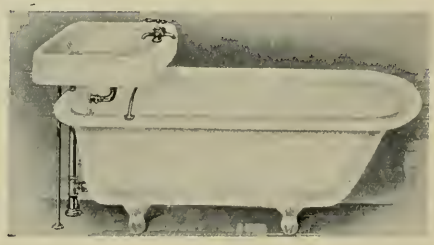

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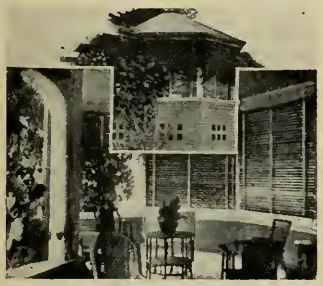

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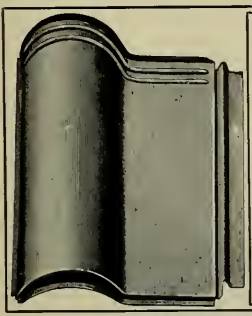

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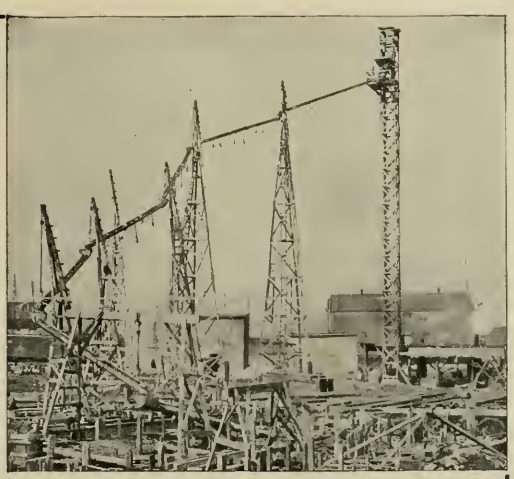

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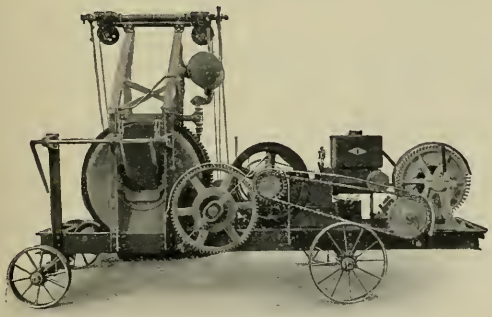

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Biturine Co., of America, 24 California St., San Francisco.
"Impervite" sold by E. A. Bullis & Co. (See advertisement on page 26.)
Imperial Waterproofing, manufactured by Imperial Co., 183 Stevenson St., San Francisco.
Trus-Con Par-Seal, made by Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and Tibbetts-Oldfield Co., Los Angeles.

CEMENT EXTERIOR FINISH
Biturine Company of America, 24 California St., San Francisco.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents on page 30.)
Glidden"s Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier Coburn Co., San Francisco, and Tibbetts-Oldfield Co., Los Angeles.
Dry Mortar Colors sold by E. A. Bullis & Co. (See advertisement, page 26.)
Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., San Francisco.
Concrete Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents on page 30.)
Glidden's Concrete Floor Dressing, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and Tibbetts-Oldfield Co., Los Angeles.
"Federal Steel Cement Hardener" manufactured by Federal Steel Cement Mills, Cleveland, represented by E. A. Bullis & Co. (See advertisement, page 26.)

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS
Fink & Schindler, 218 13th St., San Francisco.

CHUTES—GRAVITY SPIRAL
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Excello Stationary Vacuum Cleaner, F. W. Schaer Co., Pacific Coast Agts., Santa Maria Bldg., San Francisco.
Giant Stationary Suction Cleaner, San Francisco and Oakland.
Invincible Vacuum Cleaner, sold by R. W. Foyle, 149 New Montgomery St., San Francisco.
Tuec., mfrd. by United Electric Company, Coast Branch, General Contractors' Association, San Francisco.

CONCRETE CONSTRUCTION
American Concrete Co., Humboldt Bank Bldg., San Francisco.
Clinton Fireproofing Co., Mutual Bank Bldg., San Francisco.
McKibben & Taylor, 2125 Shattuck Ave., Berkeley.
Otto, W. H., 269 Park Ave., San Jose.
Foster, Vogt Co., Sharon Bldg., San Francisco.
P. A. Palmer, Monadnock Bldg., San Francisco.
Ransome Concrete Co., Oakland and Sacramento.
International Concrete Construction Company, West Berkeley, Cal.

CONCRETE HARDENERS
"Federal Steel Concrete Hardener," mfd. by Federal Steel Cement Mills, Cleveland, Ohio, sold by E. A. Bullis & Co. (See ad., p. 26.)

CONCRETE MACHINERY
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CONCRETE MIXERS
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425 Sharon Building, 55 New Montgomery St. San Francisco, Cal.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONCRETE REINFORCEMENT
- United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
- Clinton Welded Reinforcing System, L. A. Norris, 140 Townsend St., San Francisco.
- "Kahn System," see advertisement on page 31. this issue.
- International Fabric & Cable, represented by Western Builders' Supply Co., 155 New Montgomery St., San Francisco.
- Triangle Mesh Fabric. Sales Agents, Pacific Building Materials Co., 523 Market St., San Francisco.
- Twisted Bars, sold by Woods & Huddart, 444 Market St., San Francisco.

CONCRETE SURFACING
- "Biturine," sold by Biturine Co. of America, 24 California St., San Francisco.
- "Concreta" sold by W. P. Fuller & Co., San Francisco.
- Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating, sold by R. N. Nason & Co., San Francisco and Los Angeles.
- Glidden Liquid Cement, manufactured by Glidden Varnish Co., Whittier, Coburn Co., San Francisco.

CONTRACTORS, GENERAL
- American Concrete Co., Humboldt Bank Bldg., San Francisco.
- Arthur W. Biggers, 112 Market St., San Francisco.
- Collman & Collman, 526 Sharon Bldg., San Francisco.
- Construction & Engineering Co., Hobart Bldg., San Francisco.
- M. Fisher, California-Pacific Bldg., San Francisco.
- Foster, Vogt Co., Sharon Bldg., San Francisco.
- Gaspard & Hammond, Sharon Bldg., San Francisco. (See card above.)
- Howard S. Williams, Hearst Bldg., San Francisco.
- Lester Stock, 12 Geary St., San Francisco.
- McLaren & Peterson, Sharon Bldg., San Francisco.
- R. W. Moller, 185 Stevenson St., San Francisco.
- John Monk, 2016 Vallejo St., San Francisco.
- Monson Bros., 1907 Bryant St., San Francisco.
- Burt T. Owsley, 311 Sharon Bldg., San Francisco.
- Ransome Concrete Co., 1218 Broadway, Oakland.
- Western Building & Engineering Co., 455 Phelan Bldg., San Francisco.
- Williams Bros. & Henderson, Holbrook Bldg., San Francisco.

CORK FLOORING
- "Linotile," manufactured by Armstrong Cork & Insulation Company. M. C. Van Fleet, agt., 120 Jessie St., San Francisco.

CORNER BAR
- Dolbear Curb Bar, manufactured by American Steel Bar Co., 1034 Merchants Exchange Bldg., San Francisco.

CORNER BEAD
- United States Metal Products Co., 525 Market St., San Francisco.; 750 Keller St., San Francisco.

CRUSHED ROCK
- Grant Gravel Co., Flat Iron Bldg., San Francisco.
- Niles Rock, sold by California Building Material Company, new Call Bldg., San Francisco.
- Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
- Pratt Building Material Co., Hearst Bldg., San Francisco.

DAMP-PROOFING COMPOUND
- Biturine Co. of America, 24 California St., San Francisco.
- Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
- Imperial Co., 183 Stevenson St., San Francisco.
- "Impervite," sold by E. A. Bullis & Co. (See adv. on page 26.)
- Trus-Con Damp Proofing. (See advertisement of Trussed Concrete Steel Company for Coast agencies.)
- "Pabco" Damp Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
- Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS
- McCabe Hanger Mfg. Co., New York, N. Y.
- Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
- Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.

DRINKING FOUNTAINS
- Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
- N. O. Nelson Mfg. Co., 978 Howard St., San Francisco.
- Crane Company, San Francisco, Oakland, and Los Angeles.
- Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS
- Spencer Elevator Company, 173 Beale St., San Francisco.
- Burdett-Rowntree Mfg. Co., Underwood Bldg., San Francisco.

ELECTRICAL CONTRACTORS
- Butte Engineering Co., 683 Howard St., San Francisco.
- Central Electric Co., 185 Stevenson St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

ELECTRICAL ENGINEERS
- Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC PLATE WARMER
- The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
- Otis Elevator Company, Stockton and North Point, San Francisco.

MORTENSON CONSTRUCTION CO.

CONTRACTORS FOR STRUCTURAL STEEL AND IRON

H. MORTENSON, PRES. CHAS. G. MORTENSON, VICE-PRES. AND MGR.

OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS

PHONES: MISSION 5033—HOME M 3916 SAN FRANCISCO, CAL.

"FIBRESTONE"

SANITARY FLOORING, WAINSCOT AND BASE. Laid Exclusively by
FIBRESTONE & ROOFING CO., 971 Howard St. San Francisco Tel. Sutter 329

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELEVATORS—Continued.
Spencer Elevator Company, 126 Beale St., San Francisco.
San Francisco Elevator Co., 860 Folsom St., San Francisco.
Pacific Gurney Elevator Co., 186 Fifth St., San Francisco.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co., Underwood Bldg., San Francisco

ELEVATOR ENCLOSURES
J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.

ENGINEERS
F. J. Amweg, 700 Marston Bldg., San Francisco.
W. W. Breite, Clunie Bldg., San Francisco.
L. M. Hausmann, Sbaron Bldg., San Francisco.
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., Underwood Bldg., San Francisco.

FIRE EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices, Vonnegut Hardware Co. (See Adv. for Coast Agencies.)

FIRE ESCAPES
Burnett Iron Works, Fresno, Cal.
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home J. 3435. 370-84 Tenth St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIRE BRICK
Livermore Fire Brick Co., Livermore, Cal.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago. (See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
Fink & Schindler, 218 13th St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.
T. H. Meek Co., 1157 Mission St., San Francisco.

FLAG POLES—TACKLE, ETC.
Pacific Foundry Company, Harrison and 18th Sts., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.

FLOOR VARNISH—Continued.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
Glidden Products, sold by Whittier-Coburn Co., San Francisco.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., San Francisco.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.

GARDEN FURNITURE
G. Tomagnini & Co., 219 Tenth St., San Francisco.
O. S. Sarsi, 123 Oak St., San Francisco.

GAS GENERATORS
Utility Gas Generator Co., 340 Sansome St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier-Coburn Co., Howard & Beale Sts., San Francisco.

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
Raymond Granite Co., Division and Potrero Sts., San Francisco.

GRAVEL, SAND AND CRUSHED ROCK
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.

GRAVITY CHUTES
Gravity Spiral Chutes, sold by G. E. Sturgis' Supply House, 602 Mission St., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
American Keene Cement Co., 333 Monadnock Bldg., San Francisco.
"Empire" Hardwall Plaster, Pacific Portland Cement Company, Pacific Bldg., San Francisco.

HARDWARE
Russwin Hardware, Joost Bros., San Francisco.
Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, Los Angeles and San Diego.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.
Western Brass Mfg. Co., 217 Tehama St., S. F.

"White-Steel" Medicine Cabinets and Mirrors are the last word in Sanitary Bathroom Equipment. See Sweet's 1914 Catalog, Pages 1054-1055 or write for full information.

"WHITE-STEEL" SANITARY FURNITURE CO.
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Northern California
Johnson-Locke Mercantile Co.
San Francisco, Calif.

Southern California
H. R. Boynton Company
Los Angeles, Calif.

CLARENCE E. MUSTO, Pres. JOSEPH B. KEENAN, Vice-Pres. GUIDO J. MUSTO, Sec'y & Treas.

JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin —6365— **MARBLE**

OFFICE AND MILLS:
535-565 North Point St.,
SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD FLOORING
- Parrott & Co., 320 California St., San Francisco
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.
- Hardwood Interior Co., 554 Bryant St., San Francisco.

HARDWOOD LUMBER
- Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
- Parrott & Co., 320 California St., San Francisco.
- White Bros., Cor. Fifth and Brannan Sts., San Francisco.

HEATERS—AUTOMATIC
- Pittsburg Water Heater Co., 237 Powell St., San Francisco.
- Hoffman Heaters, factory branch, 397 Sutter St., San Francisco.

HEATING AND VENTILATING
- American Heat & Power Co., Oakland, Cal.
- J. M. Boscus, 975 Howard St., San Francisco.
- Fess System Co., 220 Natoma St., San Francisco.
- Mangrum & Otter, Inc., 507 Mission St., San Francisco.
- Charles T. Phillips, Pacific Building, San Francisco.
- Scott Company, 243 Minna St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
- Petersen-James Co., 710 Larkin St., San Francisco.

HOLLOW BLOCKS
- Denison Hollow Interlocking Blocks, 310 Ochsner Bldg., Sacramento, and Chamber of Commerce Bldg., Portland.

INGOT IRON
- "Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio.

INSPECTIONS AND TESTS
- Robert W. Hunt & Co., 251 Kearny St., San Francisco.

IRONING BOARDS
- Merritt Patent Ironing Board, sold by A. Hommel, agent, Atlanta Hotel, San Francisco.

JOIST HANGERS
- Western Builders' Supply Co., 155 New Montgomery St., San Francisco.

KEENE CEMENT
- American Keene Cement Co., Monadnock Bldg., San Francisco.

LIME
- Henry Cowell Lime & Cement Co., 9 Main St., San Francisco.

LIGHT, HEAT AND POWER
- Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.

LUMBER
- Dudfield Lumber Co., Palo Alto, Cal.
- Sunset Lumber Co., Oakland, Cal.
- Santa Fe Lumber Co., Seventeenth and De Haro Sts., San Francisco.
- E. K. Wood Lumber Company, East Oakland, California.

MILL WORK
- Totten & Brandt Planing Mill Co., Stockton.
- Taylor & Co., 2001 Grand St., Alameda.
- Dudfield Lumber Co., Palo Alto, Cal.

MAIL CHUTES
- Cutler Mail Chute Co., Rochester, N. Y. (See Adv. on nage 38 for Coast representatives.)

MANTELS
- Mangrum & Otter, 561 Mission St., San Francisco.

MARBLE
- Colorado Yule Marble Co., Monadnock Bldg., San Francisco.
- Joseph Musto Sons-Keenan Co., 535 North Point St., San Francisco.

MARBLE—Continued.
- G. Tomagnini & Co., 219 Tenth St., San Francisco.

MEDICINE CABINETS
- White Steel Sanitary Furniture Co., rep. by Johnson-Locke Mercantile Co., San Francisco.

METAL AND STEEL LATH
- "Steelcrete" Expanded Metal Lath, sold by Holloway Expanded Metal Company, Monadnock Bldg., San Francisco.
- L. A. Norris & Co., 140 Townsend St., San Francisco.

METAL CEILINGS
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

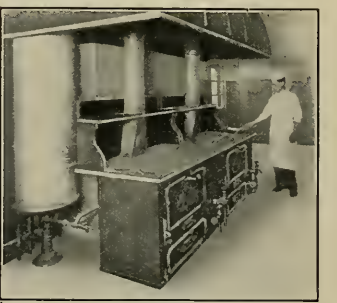
METAL DOORS AND WINDOWS
- U. S. Metal Products Co., 525 Market St., San Francisco.
- Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., San Francisco.
- Capitol Sheet Metal Works, 1927 Market St., San Francisco; 117 Franklin St., Oakland.

METAL FURNITURE
- M. G. West Co., 353 Market St., San Francisco.
- Chas. M. Finch, 311 Board of Trade Bldg., San Francisco.
- Capitol Sheet Metal Works, San Francisco and Oakland.

METAL SHINGLES
- Meurer Bros., 630 Third St., San Francisco.
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

MORTAR COLORS
- Dry Mineral Dyes, sold by E. A. Bullis & Co. (See adv., page 26.)

OIL BURNERS
- American Heat & Power Co., Seventh and Cedar Sts., Oakland.
- S. T. Johnson Co. (see adv. below).
- Fess System Co., 220 Natoma St., San Francisco.
- T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.



Crude Oil Burners Operating Kitchen Ranges in Government Barracks at Fort Winfield Scott

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Modern EQUIPMENTS for Cooking and Heating Plants
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SPENCER ELEVATOR COMPANY
126-128 Beale Street, SAN FRANCISCO Phone Kearny 664

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE
- American Art Metal Works, 13 Grace St., San Francisco.
- Brode Iron Works, 31-37 Hawthorne St., San Francisco.
- Burnett Iron Works, Fresno.
- Palm Iron & Bridge Works, Sacramento.
- California Artistic Metal & Wire Co., 349 Seventh St., San Francisco.
- J. G. Braun, Chicago and New York.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- Monarch Iron Works, 1165 Howard St., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., Sain Francisco.
- Shreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.
- Vulcan Iron Works, San Francisco.

PAINTING AND DECORATING
- D. Zelinsky, 564 Eddy St., San Francisco.
- Robert Swan, 1133 E. 12th St., Oakland.

PAINT FOR BRIDGES
- Biturine Company of America, 24 California St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.). (See Adv. in this issue for Pacific Coast agents.)
- "Biturine," sold by Buturine Co. of America, 24 California St., San Francisco.
- Trus-Con Stone Tex., Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Tibbetts-Oldfield Co., Los Angeles.
- Concreto Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
- "Technola," a cement paint, sold by C. Roman, San Francisco.

PAINT FOR STEEL STRUCTURES
- "Biturine," sold by Biturine Co. of America, 24 California St., San Francisco.
- Carbonizing Coating. Made by Goheen Mfg. Co., Canton, Ohio. C. W. Coburn & Co., 320 Market St., San Francisco, and A. J. Capron, Ainsworth Bldg., Portland, Agents.
- Trus-Con Bar-Ox, Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco, and Tibbetts-Oldfield Co., Los Angeles.

PAINTS, OILS, ETC.
- Bass-Heuter Paint Co., Mission, near Fourth St., San Francisco.
- Whittier-Coburn Co., Howard and Beale Sts., San Francisco.

PAINTS, OILS, ETC.—Continued.
- W. P. Fuller & Co., all principal Coast cities.
- "Biturine," sold by Biturine Co. of America, 24 California St., San Francisco.
- Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., San Francisco and Tibbetts-Oldfield Co., Los Angeles.
- Paraffine Paint Co., 38-40 First St., San Francisco.
- R. N. Nason Co., San Francisco.
- Standard Varnish Works, 113 Front St., San Francisco.

PAVING BRICK
- California Brick Company, Phelan Bldg., San Francisco.

PHOTO ENGRAVING
- California Photo Engraving Co., 121 Second St., San Francisco.

PHOTOGRAPHY
- R. J. Waters Co., 717 Market St., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.
- Pacific Sewer Pipe Co., I. W. Hellman Bldg., Los Angeles.
- Pratt Building Material Co., Hearst Bldg., San Francisco.
- Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PLASTER CONTRACTORS
- A. Knowles, 985 Folsom St., San Francisco.
- C. C. Morehouse, Crocker Bldg., San Francisco.
- J. J. Connolly & Son, Builders' Exchange, San Francisco.

PLUMBERS' MARBLE HARDWARE
- Western Brass Mfg. Co., 217 Tehama St., S. F.

PLUMBING
- Boscus Bros., 975 Howard St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Peterson-James Co., 710 Larkin St., San Francisco.
- Wittman, Lyman & Co., 341 Minna St., San Francisco.
- Alex Coleman, 706 Ellis St., San Francisco

PLUMBING FIXTURES. MATERIALS, ETC.
- Crane Co., Second and Brannan Sts., San Francisco.
- N. O. Nelson Mfg. Co., 978 Howard St., San Francisco.
- California Steam Plumbing Supply Co., 671 Fifth St., San Francisco.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Western States Porcelain Co., San Pablo, Cal.

POTTERY
- Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PUMPS
- Chicago Pump Company, 612 Howard street, San Francisco.

HERE IT IS **MADE IN CALIFORNIA, TOO!**
A High Class Washable Paint for Inside Walls.
OPAQUE FLAT FINISH
Less material required to cover surface than any similar product on the market.
R. N. NASON & CO., 151-161 Potrero Avenue 54-56 Pine Street **SAN FRANCISCO**

Phone Lakeside 91

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DAMP-PROOFING AND COMPOSITION FLOORING

EVERYTHING IN ROOFING

Rooms 206-207 PLAZA BUILDING, Fifteenth and Washington Streets, OAKLAND

ARCHITECTS' SPECIFICATION INDEX—*Continued*

REFRIGERATORS
- McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.
- Vulcan Iron Works, San Francisco.

REVERSIBLE WINDOWS
- Hauser Reversible Window Company, Balboa Bldg., San Francisco.

REVOLVING DOORS
- Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROCK BREAKING MACHINERY
- Vulcan Iron Works, Francisco and Kearny Sts., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
- Pacific Building Materials Co., 523 Market St., San Francisco.
- C. F. Weber & Co., 365 Market St., San Francisco.
- Kinnear Steel Rolling Doors, W. W. Thurston, agent, Rialto Bldg., San Francisco.
- Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles.

ROOFING AND ROOFING MATERIALS
- Biturine Co. of America, 24 California St., San Francisco.
- Grant Gravel Co., Flat Iron Bldg., San Francisco.
- Fibrestone & Roofing Co., 971 Howard St., San Francisco.
- National Roofing Company, Plaza Bldg., Oakland.
- "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
- Mackenzie Roof Co., 425 15th St., Oakland.
- United Materials Co., Crossley Bldg., San Francisco.

ROOFING TIN
- American Sheet & Tin Plate Co., Pacific Coast representatives, U. S. Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
- Meurer Bros., A. H. MacDonald, agent, 630 Third St., San Francisco.

SAFES, VAULTS, BANK EQUIPMENT
- M. G. West Co., 353 Market St., San Francisco.

SANITARY DRINKING FOUNTAINS
- N. O. Nelson Mfg. Co., 978 Howard St., San Francisco.
- Haws' Sanitary Drinking Faucet Co., 1808 Harmon St., Berkeley.

SANITARY BATH FIXTURE
- "Boudoir" bath tub, mfrd. by Improved Sanitary Fixture Co., 411 S. Los Angeles St., Los Angeles. Sold by all plumbing houses.

SANITARY KITCHEN SINK
- Improved Sanitary Fixture Company, 411 S. Los Angeles St., Los Angeles.

SASH CORD
- Regal Sash Cord, Louisville Selling Co. represented on Pacific Coast by Baker & Hamilton.
- Samson Cordage Works, manufacturers of Solid Braided Cords and Cotton Twines, 88 Broad St., Boston, Mass.

SCENIC PAINTING—DROP CURTAINS, ETC.
- The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
- C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.

SEWAGE EJECTORS
- Chicago Pump Co., represented by Telephone Electric Equipment Co., 612 Howard street, San Francisco.

SHEATHING AND SOUND DEADENING
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

SHEET METAL WORK, SKYLIGHTS, ETC.
- Capitol Sheet Metal Works, 1927 Market St., San Francisco.
- U. S. Metal Products Co., 525 Market St., San Francisco.

SHINGLE STAINS
- Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.

STEEL AND IRON—STRUCTURAL
- Burnett Iron Works, Fresno, Cal.
- Central Iron Works, 621 Florida St., San Francisco.
- Dyer Bros., 17th and Kansas Sts., San Francisco.
- Brode Iron Works, 31 Hawthorne St., San Francisco.
- Judson Manufacturing Co., 819 Folsom St., San Francisco.
- Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
- J. L. Mott Iron Works, D. H. Gulick, agents, 135 Kearny St., San Francisco.
- Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
- Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J. 3435, 370-84 Tenth St., San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
- U. S. Steel Products Co., Rialto Bldg., San Francisco.
- Schreiber & Sons Co., represented by Western Builders Supply Co., S. F.
- Vulcan Iron Works, San Francisco.
- Western Iron Works, 141 Beale St., San Francisco.
- Woods & Huddart, 444 Market St., San Francisco.

STEEL PRESERVATIVES
- Biturine Company of America, 24 California St., San Francisco.
- Wadsworth, Howland & Co., Boston Mass. (See Adv. for Coast agencies.)

STEEL BARS FOR CONCRETE
- Kahn and Rib Bars, made by Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Woods & Huddart, 444 Market St., San Francisco.

CALIFORNIA ARTISTIC METAL & WIRE CO.

J. T. McCORMICK - President

ORNAMENTAL IRON & BRONZE WORK

349-365 SEVENTH ST. SAN FRANCISCO.

TELEPHONE: MARKET 2162

Mr. Architect—

If You are Designing a Home for a Lady Client whom You Want to be Satisfied

Would You—

— Avoid fouling the sink and dishwater?
— Avoid staining and scouring the sink?
— Prevent clogging the drain pipe?
— Save her hands from hot greasy dishwater?
— Save many minutes, much scraping, picking and drudgery, after each meal, every day in the year?

If you would avoid all these unpleasantries specify

THE "HELP-HER" IMPROVED SANITARY KITCHEN SINK

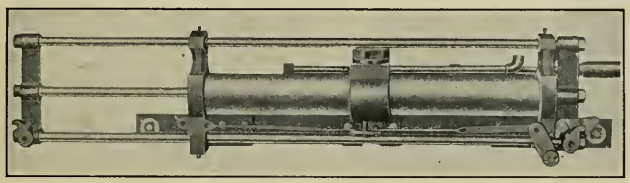
Is furnished in sizes to replace common sinks. No extra space or Plumbing required.

Apply to your Plumber or write

IMPROVED SANITARY FIXTURE CO.

TELEPHONE F 2964

411 So. Los Angeles St. LOS ANGELES, CAL.



Burdett Rowntree Pneumotic Door Operoting Device

BURDETT ROWNTREE MFG. CO.

Dumbwaiters
Door Operating Devices
Elevator Interlocks

323 Underwood Building,
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ELEVATOR SUPPLY & REPAIR CO.

Elevator Signals
Elevator Accessories
Norton Door Closers

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San Francisco, - - Cal.

G. TOMAGNINI & CO.

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Statuary, Monuments, Mantels, Architectural Work, Garden and Hall Furniture

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL MOULDINGS FOR STORE FRONTS
J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.
STEEL FIREPROOF WINDOWS
United States Metal Products Co., San Francisco and Los Angeles.
STEEL STUDDING
Collins Steel Partition, Parrott & Co., San Francisco and Los Angeles.
STEEL ROLLING DOORS
Kinnear Steel Rolling Door Co., W. W. Thurston, Rialto Bldg., San Francisco.
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Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.
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Boise Sandstone Co., Boise, Idaho.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.
Colusa Sandstone Co., Potrero Ave. and Division St., San Francisco.
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J. B. Nabors & Sons, Kohl Bldg., San Francisco.
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Pacific Coast Casualty Co., Merchants' Exchange Bldg., San Francisco.
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C. F. Weber & Co., 365 Market St., San Francisco.
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Telephone Electric Equipment Co., 612 Howard St., San Francisco.
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Mangrum & Otter, 561 Mission St., San Francisco.
The Mosaic Tile Co., 230 Eighth St., San Francisco.
TILE FOR ROOFING
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Gladding, McBean & Co., Crocker Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.
TILE WALLS—INTERLOCKING
Denison Hollow Interlocking Blocks, Ochsner Bldg., Sacramento.
TIN PLATES
American Tin Plate Co., Riato Bldg., San Francisco.
VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
Western States Porcelain Co., Richmond, Cal.
VACUUM CLEANERS
Giant Stationary Suction Cleaner, manufactured by Giant Suction Cleaner Co., 731 Folsom St., San Francisco and Third and Jefferson Sts., Oakland.
Invincible Vacuum Cleaner, R. W. Foyle, Agent, San Francisco.
"Excello" Stationary Vacuum Cleaner, F. W. Schaer Bros., Pacific Coast agents, Santa Maria Bldg., San Francisco.
"Tuec" Air Cleaner, manufactured by United Electric Co., 110 Jessie St., San Francisco.
VACUUM CLEANERS—Continued.
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Jenkins Bros., 247 Mission St., San Francisco.
VALVE PACKING
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Glidden Varnish Co., Cleveland, O., represented on the Pacific Coast by Whittier-Coburn Co., San Francisco.
Standard Varnish Works, 113 Front St., San Francisco.
S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.
Moller & Schumann Co., Hilo Varnishes, 1022-24 Mission St., San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.
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WALL BOARD
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WALL SAFES
Lowrie Wall Safe, sold by C. Roman Co., 173 Jessie St., San Francisco.
WATERPROOFING FOR CONCRETE, BRICK, ETC.
"Impervite," sold by E. A. Bullis & Co. (See adv. on page 26.)
Concreto Cement Coating, manufactured by the Muralo Co. (See page 124.)
Fibrestone & Roofing Co., 971 Howard St., San Francisco.
Glidden's Concrete Floor Dressing and Liquid Cement Enamel, sold on Pacific Coast by Whittier Coburn Company, San Francisco.
Imperial Co., 183 Stevenson St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Wadsworth, Howland & Co., Inc. (See Adv. for Coast agencies.)
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"Satinette," Standard Varnish Works, 113 Front St., San Francisco.
Trus-Con Sno-wite, manufactured by Trussed Concrete Steel Co. (See Adv. for Coast distributors.
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Whitney Adjustable Window Co., San Francisco. (See page 25.)
Hauser Reversible Window Co., Balboa Bldg., San Francisco.
WINDOW SHADES
Top Light Shade Co., 737 Market St., Oakland.
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U. S. Steel Products Co., Rialto Bldg., San Francisco.
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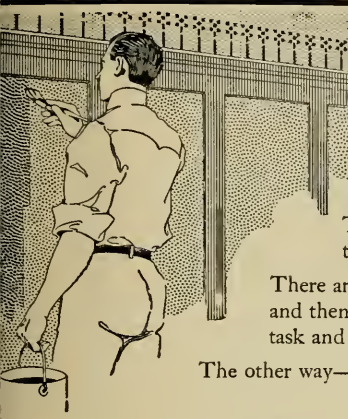
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.



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Today most of the interior woodwork has a flat finish—that is, without lustre.

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This is a preparation for producing a rubbed effect on all classes of woodwork without the labor or expense.

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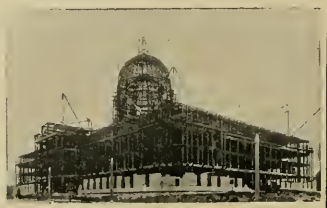

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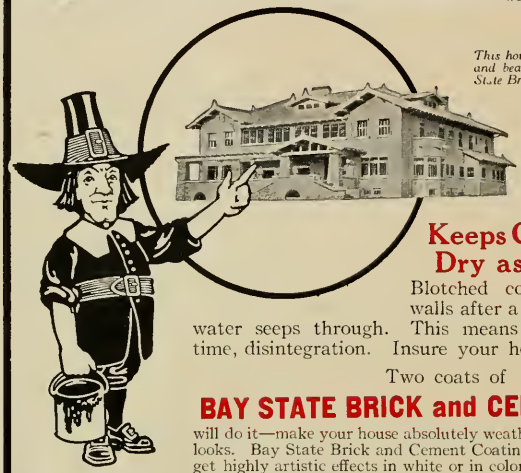

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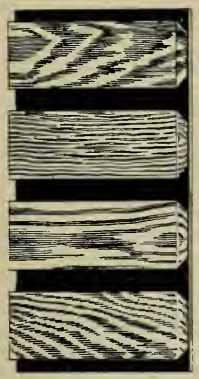

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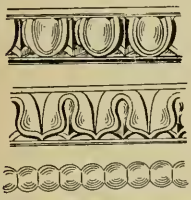

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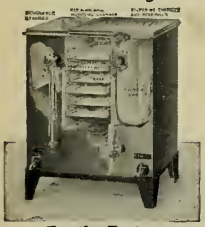

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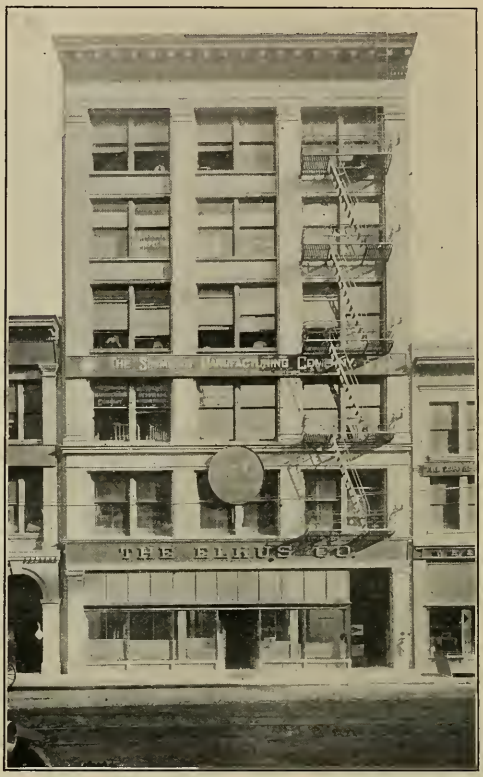

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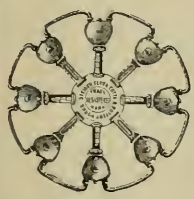

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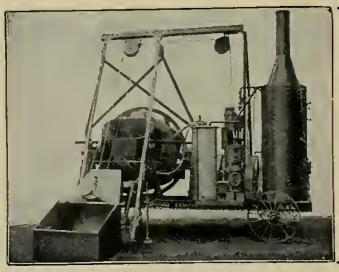

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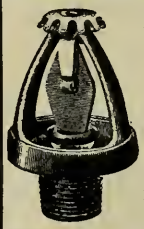

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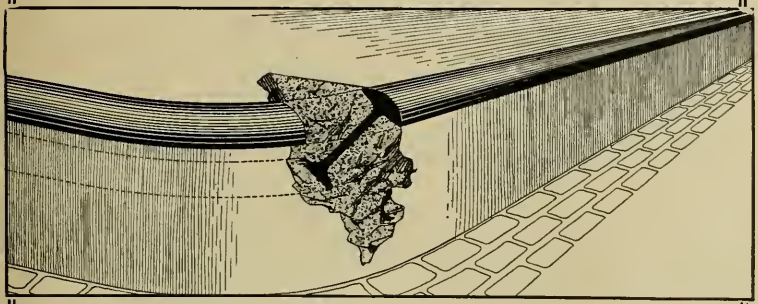

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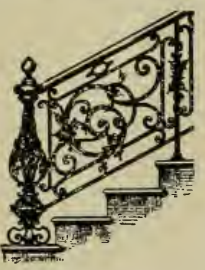

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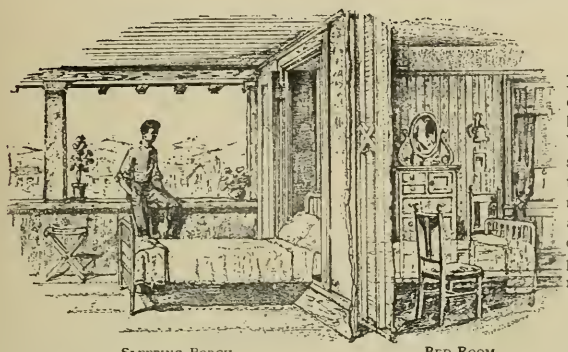

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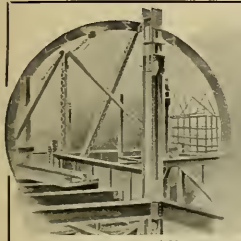

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The Architect and Engineer
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A LOOK-OUT TOWER IN SWITZERLAND
WATER COLOR BY FRANZ HARDING
With R. A. Herold, Architect, Sacramento

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XL. FEBRUARY, 1915 No. 2.

HOUSE OF MR. C. WESLEY ROBERTS, LOS ANGELES
B. Cooper Corbett, Architect

Some Houses in Southern California Designed by B. Cooper Corbett, A. I. A.

By ROSS WILTON EDMINSON

MR. B. COOPER CORBETT of Los Angeles, a student of the French and Italian schools, has established a precedent in Southern California pertaining to a style that heretofore had not been introduced in the Western States. This is noticeable even in his earlier designs, produced soon after he left Messrs. McKim, Mead & White, when that firm had more than a hundred draftsmen in its employ. We see the exquisite influences of his hand while a designer in the offices of various Southern California architects and the same feeling may be traced to his present-day practice.

One of Mr. Corbett's earliest and best designs in domestic architecture is the residence of Mr. C. Wesley Roberts in Berkeley Square, Los Angeles. This house was erected in 1910, the substructure being of reinforced concrete, including the floors and supporting beams. These beams serve a twofold purpose; first, as an architectural embellishment; and second, to carry the floor loads.

PERGOLA, HOUSE OF MR. C. WESLEY ROBERTS, LOS ANGELES
B. Cooper Corbett, Architect

The plan of the first floor is not unusual, but on the other hand very simple, yet in its simplicity lies the charm of best ideas, that of symmetry. One enters the house through a well-lighted vestibule with living-room on the left, dining-room on the right, and access to second floor by wide stairs. Passing under these stairs directly to the rear we see a semi-enclosed patio paved in cement and surrounded by concrete columns. The living-room is finished in San Domingo mahogany with built-in bookcases and furniture to match. The stair hall has the same finish. Here the rich red paneling of the mahogany is carried to the ceiling in two-foot width. The dining-room to the right is paneled in quarter-sawed oak from floor to ceiling, bringing to mind the Flemish idea with furniture made-to-order through the wishes of the architect.

The second floor has a central hall over the one below with bedroom suites on both sides, each suite consisting of a bedroom, bath, dressing-room and spacious closets. There are four of these, and one is used as a guest's chamber for an occasional visitor. The wood throughout this floor is finished in white enamel, and the wall surfaces of hard plaster toned down to soft, pleasing colors.

The house, including a garage in the rear, was built by day labor at a total cost of $20,000.

Another house from the drawing board of Mr. Corbett is that of the Charles Sharp residence in the Wiltshire boulevard district, Los Angeles. Formerly it was the residence of Mr. Kornblum, but since the transfer

ENTRANCE, HOUSE OF MR. CHARLES AMILLO
B. COOPER CORBETT ARCHITECT

HOUSE OF MR. CHARLES AMILLO, LOS ANGELES
B. Cooper Corbett, Architect

HOUSE OF MRS. LOUISE DENKER, LOS ANGELES
B. Cooper Corbett, Architect

TOWER. HOUSE OF MR. CHARLES SHARP, LOS ANGELES
B. COOPER CORBETT, ARCHITECT

HOUSE OF MR. CHARLES SHARP, LOS ANGELES
B. Cooper Corbett, Architect

CONSERVATORY, HOUSE OF MR. CHARLES SHARP, LOS ANGELES
B. Cooper Corbett, Architect

GARDEN AND PERGOLA, HOUSE OF MR. CHAS. SHARP, LOS ANGELES
B. Cooper Corbett, Architect

the new owner had the left-hand gable and conservatory added. The house has been pronounced one of the best examples of half-timber work in the Southland.

It may be of interest to note that when Mr. Sharp came to Los Angeles a few years ago to look for a home he passed this house at noon, and by nightfall he was the owner of it, enjoying his first meal there a few hours after he saw the place. The transaction amounted to $150,000, inclusive of its furnishings.

The living-room occupies the east end, the house faces south, with a music-room in the rear, and has mahogany trim. A massive fireplace of Utah white sandstone reaching to the ceiling is one of several striking features of this house. The room is furnished in dark red-brown colors with a single Oriental rug of generous proportion covering the floor. The dining-room is completely paneled in San Domingo mahogany, carrying out the Jacobian period. A built-in sideboard faces the dining-room door, which is similar to the one in the Denker house, save for a leaded glass window over the mirror. Opening from this room are French doors flanking the sideboard, which give entrance to the conservatory—a room that covers the entire width of the house. The finish is redwood, stained a gray-green color and then rubbed. The floor is of red tile.

The Perry house in Hollywood is one of Mr. Corbett's latest works. It is suggestive of the Italian villa type and its setting is enhanced by the wonderful mountain formation which surrounds it. Hollywood enjoys a sunny climate, and its many knolls have beautiful homes which command

HOUSE OF MR. C. F. PERRY, HOLLYWOOD, CALIFORNIA
B. Cooper Corbett, Architect

LIVING ROOM AND HALL, HOUSE OF MR. C. F. PERRY, HOLLYWOOD, CALIFORNIA
B. Cooper Corbett, Architect

BUNGALOW OF MR. JOHN W. EDMINSON, PASADENA, CALIFORNIA
B. Cooper Corbett, Architect

BRICK STEPS AND PORCH, EDMINSON BUNGALOW
B. Cooper Corbett, Architect

DINING ROOM, EDMINSON BUNGALOW
B. Cooper Corbett, Architect

LIVING ROOM, EDMINSON BUNGALOW
B. Cooper Corbett, Architect

a wonderful view of sea and mountain. It is the growing suburb of Los Angeles, and soon will become as renowned as Pasadena.

The exterior of Mr. Perry's house is brick with plaster finish, the best type of construction, and the only that will stand against time. The Doric columns of the entrance porch are concrete and plastered to match the wall surfaces. The ornaments over the arched windows are staff and painted white to match the plaster finish. The red tiles of the roof are a local product, and were made in Los Angeles.

With the exception of the dining-room, which is mahogany, the entire lower floor is finished in French gray enamel similar in tone to the John W. Edminson residence of Pasadena. This harmonizes well with the furnishings, and gives a brighter aspect to the inside on dark days.

The construction of the residence of Mrs. Louise Denker is the same as the Perry house in Hollywood. The pleasing proportion of the facade is classic, French doors and windows bringing to mind some palace of the Old World. The bay tree boxes of the front steps are especially noteworthy in design, and add greatly to the finishing features of the house.

The hall, living-room and dining-room are in mahogany finish with furniture to match the woodwork, and that of the dining-room is very well carried out, of which the built-in sideboard is the attraction. In this house the architect either selected or designed the furniture himself in order to have unity with his work. Even the hardware was carefully thought out, and it was found that the Guerin period came the nearest to harmonizing with the interior. The electroliers and decoration are also from the designs submitted by the architect.

A house of smaller proportions and design is that of Mr. Charles Amillo. It is simple, plain, and attractive to those who admire the "Small Rivera Style." The exterior is plaster on metal lath; not so sturdy as plaster on brick, but here the architect was compelled to keep within an $8,000 limit.

The plan is very simple as may be construed from the straight-forward lines of the exterior. A pergola adds beauty to the house, and other details, such as the hood over the doorway and the paved terrace in front, give a welcomed note to the site on a double corner.

Although Mr. Corbett has traveled considerably he is ever on the alert for new ideas and his training in the Beaux Arts Society is continually showing itself in his now growing practice. It is one thing to have an architectural education, but that is not enough, the architect must increase his knowledge by constant study and travel if he would be a success.

* * *

Out of Doors Mural Painting

For the first time in the history of world's expositions, great mural paintings have been used out of doors. These are the work of some of the most famous artists, including the celebrated "ten American painters." The murals have been made upon canvas with a view of their permanent preservation. Two huge canvases, each 46x16 feet, by Frank Du Mond and Edward Simmons are placed in the triumphal arches in the Court of the Universe. Du Mond's canvases depict the movement of immigration from New England westward to California and the labors of the empire builders in the Golden land. Simmons' paintings are more purely allegorical, with many female figures done in soft, bright tones, with novel and masterly technique.

TIVOLI THEATER, SAN FRANCISCO, DESIGNED FOR GRAND OPERA, BUT USED FOR HIGH CLASS "MOVIE" ATTRACTIONS
O'BRIEN & WERNER, ARCHITECTS

ALAMEDA MOVING PICTURE THEATRE
A. W. Cornelius, Architect

Development of the Moving-Picture Theatre

WITH the growing popularity of the moving-picture show has come a demand for better theatres for this class of amusement, and it is no exaggeration to say that the future will likely see as much money spent in the design and construction of "movie" theatres as has heretofore been expended for the pretentious opera and vaudeville houses, which means that the "movie" is a money-making proposition and is unquestionably here to stay. That it has made disastrous inroads upon the legitimate theatrical business is evidenced by the fact that many of the best playhouses are being converted into moving-picture theatres. The Tivoli Theatre in San Francisco is an example. This structure was built five years ago at an outlay of nearly one-half million dollars. Built for grand opera with seats bringing from one to five dollars each, we find it today the home of the movie—admission 15 and 25 cents.

The original moving-picture theatres of about ten years ago, as we all remember them, were opened in small stores altered for the purpose. These were, in most cases, non-fireproof, without means of ventilation other than the entrance doors, and in isolated cases, the owners, as a concession to the needs of humanity, provided one or two small ventilators in the roof, when the building was one story in height.

The means of egress were absolutely inadequate as was proven by the number of catastrophes which have occurred at various times, causing loss of life and injury all out of proportion to the number of occupants. At that time the picture machines themselves were primitive affairs and there was constant danger from fire.

The repetition of panics due to fires and poor construction of the booths enclosing the picture machines and defective mechanical devices in the machines themselves, caused the enactment of various municipal regulations in the different large cities of the country governing the construction and operation of these places of amusement. One of the first results of these laws was the rapid increase in the cost of buildings for exhibiting pictures due to the special requirements of the various building codes. It then became necessary for an owner

of a picture-house to have increased seating capacity to be able to obtain a suitable income from the investment.

Starting at the beginning, writes Mr. P. R. Pereira in the American Architect, one of the first things to consider in designing one of the larger types of moving-picture theatres, is whether or not a stage shall be provided and if so, of what depth and how equipped. It has generally been conceded by theatre owners that where an auditorium of large capacity is required, it is the better part of prudence to provide a stage, even if not more than twenty-five feet from curtain line to back wall and of greater depth, if not too great a sacrifice of seats is required. This is a portion of the problem, however, which is usually decided by the owner, who, if he is a man of experience in the operation of theatres, will have already developed decided views on this point.

After having settled upon the main lines of the building, and general arrangement of the walls, we have to consider the basement. It is not usual to provide a trap pit under the stage as is the case of a theatre for dramatic or spectacular productions, the only excavation in that portion being that required for musicians' room, toilet facilities, or such spaces as may be needed for mechanical appliances in connection with both the heating and ventilation systems.

From the musicians' room, access is given to the orchestra pit by means of a doorway provided between the wall separating the stage house from the auditorium and a fire cut-off, formed by means of Underwriter's automatic tin-clad doors.

Very often the owners have an organ installed in addition to the orchestra. It has been found by experience the best place for the organ machinery and pipes is under the stage near the orchestra pit, with spaces provided over the proscenium boxes for the echo organ.

Unless existing conditions are most favorable from the standpoint of cost, the greater portion of the orchestra floor is laid directly on the soil, which is graded to the proper contours.

Very often it is found convenient to locate the men's smoking room and men and women's toilets in the basement at the rear of the orchestra, with stairways leading directly from the auditorium. The cloak rooms may also be placed here.

The remainder of the excavated portion of the basement is taken up with the boiler rooms, coal storage space, transformer room, pump rooms, fan rooms and other spaces for mechanical appliances, which should be kept adjacent to each other for economy and convenience of operation.

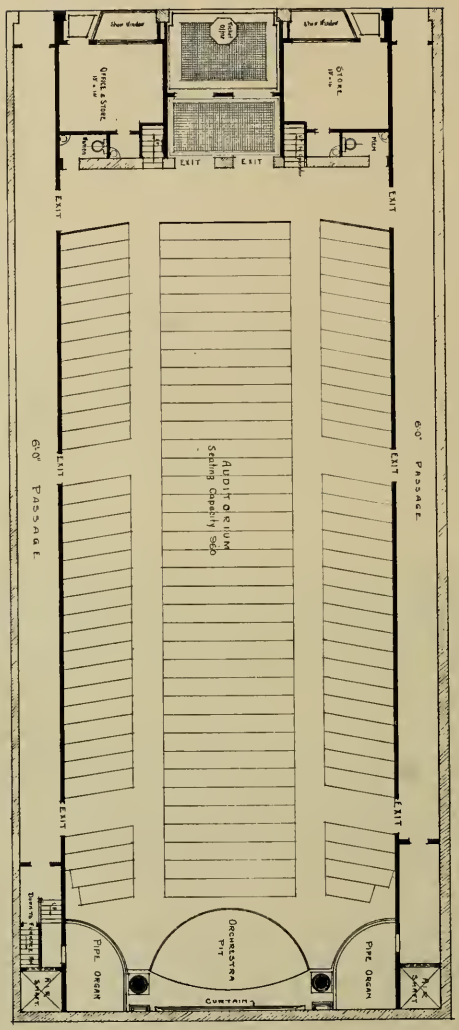
In planning the ground or orchestra floor, one is governed very much by the same limitations of construction and conditions as an ordinary playhouse, excepting only that one must remember that in this type of building the crowds are constantly coming and going, thus requiring unusually good means of ingress and egress.

A commodious lobby should be arranged for, since it has been the experience of the owners of this type of theatre in the past that a large space is required to accommodate the crowds waiting for entrance, special attention being given to separating the incoming and outgoing people.

A box office should be located in the lobby, but not extended into it so as to form an obstruction. Here should be placed the switch controlling the lobby and sign lights. It should also have telephonic communication with the stage, the orchestra and manager's office.

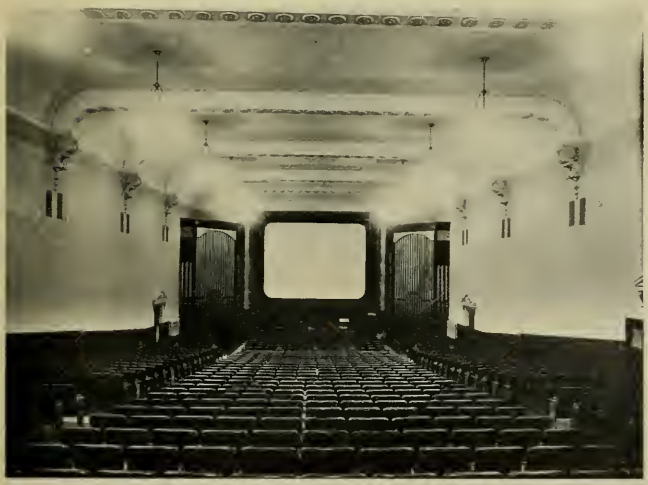
In houses of great capacity, more than one box office should be provided. It is often found particularly advantageous to have a small portable ticket booth located in the center or side of the main entrance at the sidewalk.

THEATRE DE LUXE, SAN JOSE *William Binder, Architect*



FLOOR PLAN, FRANKLIN THEATRE
OAKLAND, CALIFORNIA
C. H. MILLER, ARCHITECT

FRANKLIN THEATRE, OAKLAND, CALIFORNIA
C. H. Miller, Architect



INTERIOR FRANKLIN THEATRE, OAKLAND
C. H. Miller, Architect

This latter, however, is not an improvement from an esthetic standpoint.

The decoration and design of the lobby, of course, depends largely on the architect's taste, the class of patronage expected and the limits of the client's purse.

In this connection, it is well to keep in mind the durability of the materials to be employed. We must remember, in the first place, that a large theatre, seating several thousand people, will have possibly from five to ten thousand people passing through the lobby, coming and going each day and evening; this causes great wear and tear on the flooring, so that the materials used should be selected for hardness as well as beauty.

Very often it is desirable to slope the floor of the lobby for the purpose of eliminating steps which should be avoided even where not prohibited by law. In such cases, materials of a non-slippery nature should be employed.

In modern picture houses and, in fact, in most of the more recent playhouses, it has been found best to omit the gallery or second balcony entirely. The advantage of this is not only from a standpoint of economy, which is effected by the fact that the auditorium may be reduced in height, but a finer architectural effect may be obtained. Also in modern picture houses, even where vaudeville is presented in connection with the pictures, the prices are in most cases moderate, and it is found that a certain class of patrons will be kept away in the event of their having to climb to an upper balcony or gallery. In this connection it is well to provide the entrance to the balcony through the main entrance, as is usual in the regular theatre, access to same being greatly improved by providing a mezzanine directly over the rear of the orchestra from which tunnels or vomitories are extended, bringing the patrons out of the lower portions of the balcony and at those points placing ushers to direct the patrons to their seats. At the openings, a crossover aisle is nearly always provided; that is, a stepping wider than the other steppings of the balcony on which the seats are located. Seats are sometimes provided at the back of this crossover. In houses of great depth, more than one crossover is found necessary and the main balcony stairs are extended up to a second mezzanine with additional outlets further up the balcony. This arrangement of crossover aisles and tunnels eliminates the necessity of climbing to the rear or highest point of the balcony and then walking down the aisles to reach the lower or front portion, which is, of course, inconvenient for the patrons of the continuous performance house, as it creates unnecessary disturbance.

In a theatre of this nature, it is necessary to provide continuous subdued lighting so placed as not to interfere with the brilliancy of the moving picture; for this purpose cove lighting, *i. e.*, lights arranged in coves formed in the ornamental plaster and provided with reflectors, is very effective. A less expensive method, however, is that provided by means of indirect lighting fixtures, thus eliminating the necessity for the expense entailed by providing coves and the expensive furring required. Sufficient additional lighting should be provided so that the house may be brilliantly illuminated when desired, such as at intermissions. Sign lighting and arc light outlets should be located at the entrance as well as connections to the circuits, illuminating the marquise over the entrance or entrances. The outer vestibule and lobby is usually lighted in such a manner as to provide great brilliancy.

One of the parts in the problem of designing this type of building is determining upon the location of the booth containing the machines projecting the pictures. In a steep balcony, if the booth is located at the rear,

NEW T. & D. THEATRE, BERKELEY
A. W. CORNELIUS, ARCHITECT

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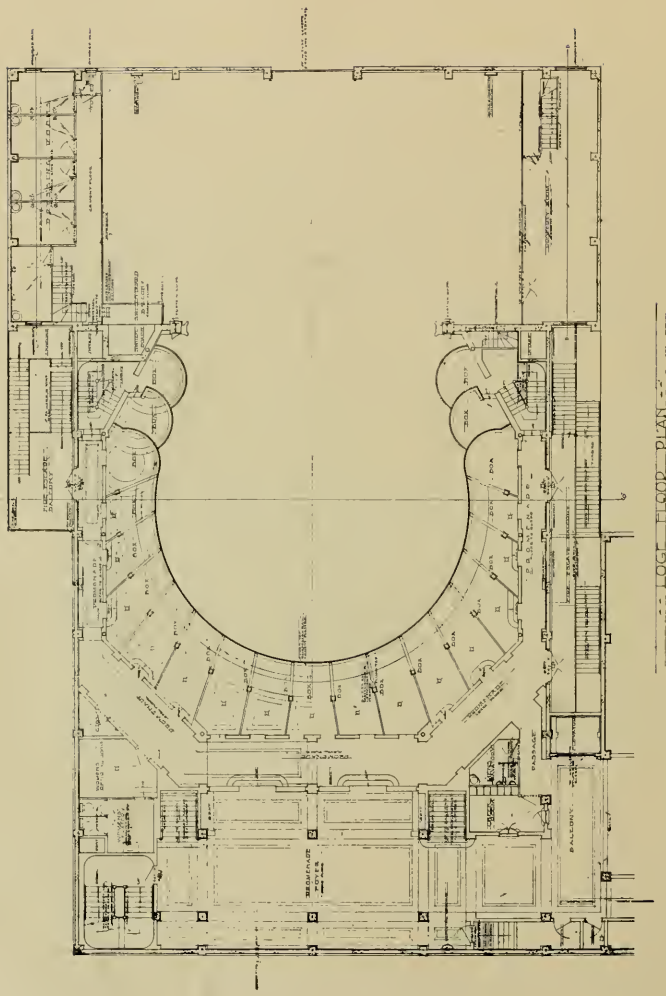
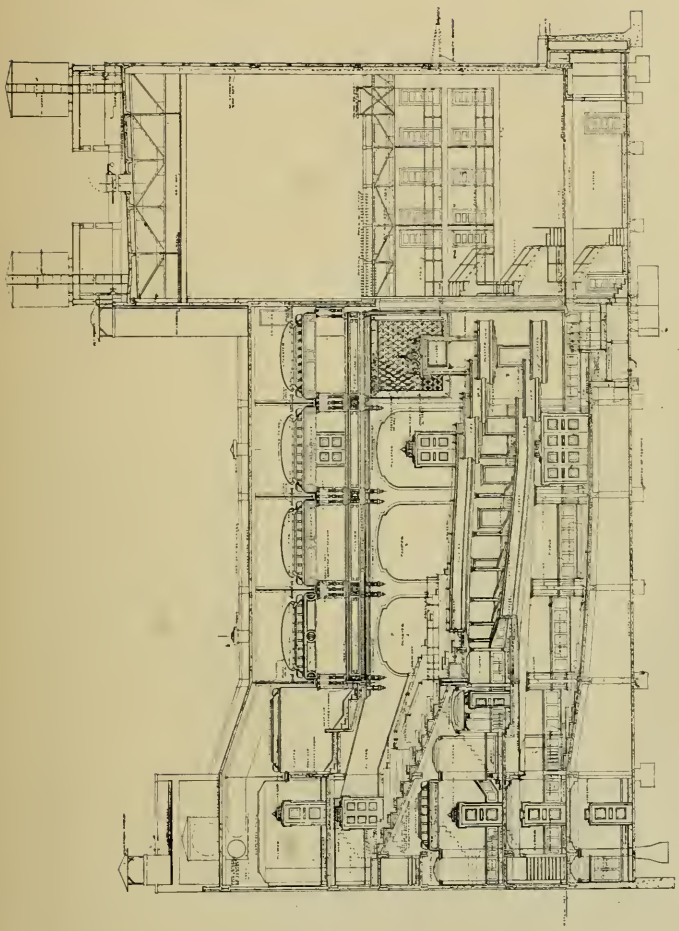


TIVOLI THEATRE, SAN FRANCISCO
O'BRIEN & WERNER, ARCHITECTS



SECTION THRO MAIN AXIS OF THEATRE

TIVOLI THEATRE, SAN FRANCISCO
O'BRIEN & WERNER, ARCHITECTS

the angle of light on the screen tends to distort the pictures. This is sometimes overcome by tilting the picture screen forward at the lower edge, thus correcting the distortion to a certain extent. A much better location for the booth is below the balcony at the rear of the orchestra. Such a position, however, usually results in the sacrifice of some of the most desirable seats, and also has a further disadvantage in that, in the event of a fire or smoke in the booth, it is readily seen by the audience in the orchestra, and might possibly create a panic, whereas if the booth is placed in the rear of the balcony, a small fire or smoke caused by a short circuit or other causes, will not be noticed. The internal arrangement of the booth should be such as to provide a rewinding room with automatic self-closing doors, suitable ventilation by means of ducts to the outer air and ventilating registers in the face of the booth, so placed that light from the interior will not be thrown into the auditorium. The usual openings for one or more machines should be provided. In addition, peepholes for the operators and fireproof sliding shutters with fusible links.

The heating and ventilating problem of this type of building is similar to that encountered in most auditoriums. It is usual to provide a system of ventilation by means of fans in the basement blowing the fresh air through tempering coils and filters to ducts below the orchestra floor, and from there up through ventilating chases to the orchestra and balcony.

* * *

Lien Law Bond Invalid

An amendment to the mechanic's lien law adopted in 1911 making it obligatory for a contractor to give to a property owner a bond for the protection of all material dealers and laborers is unconstitutional, according to a decision recently handed down by Judge Troutt of San Francisco. The court held that the law violates the Federal Constitution by unfair discrimination, as none besides builders and contractors is compelled to give bonds to guarantee payment for material and labor. Furthermore, it in effect imposes a burden upon the owner because if he does not compel the contractor to put up a bond he himself is responsible for the contractor's debts. The decision was given in sustaining the demurrer of the National Surety Company to a complaint filed by Charles M. Woods and Frederick D. Huddart against Neil A. McLean and the Stewart Estate Company.

* * *

Single Sugar Pine Yields Enough Lumber to Build Suburban House

The United States government has received $99.40 in settlement for a single sugar pine tree which was cut in trespass in the Stanislaus National Forest in California, and which yielded more than enough actual lumber to build a good-sized suburban frame house. The tree scaled 18,933 board feet and was valued at $5.25 per thousand feet. Not many trees contain enough lumber to build a two-foot board walk nearly two miles long, and this is believed to be the first case on record in which a single tree felled in a National Forest was valued at almost $100 on the stump, although National Forest timber is frequently sold at considerably higher rates.

The Architect in Cost Plus Contracts

By WILLIAM L. BOWMAN, C. E., in the Brickbuilder

THE most common and familiar form of cost plus contracts is termed the percentage contract where the contractor is paid a certain defined cost of the construction work with a specified percentage thereon as compensation for his overhead expenses, personal services, and profit. Another form of these contracts is the cost plus a fixed sum contract where a specified fixed sum is added to the defined cost to cover the items just mentioned. As this sum is usually calculated upon a certain percentage of the estimated cost, it ordinarily amounts to the same sum as the percentage. This is especially true since such contracts usually provide that if the magnitude of the undertaking is increased, the fixed sum to be paid the contractor shall be increased in the same proportion that the fixed sum to be paid bears to the cost of the original undertaking. There is still another form of contract which properly comes under this appellation, namely, where the owner agrees to pay for all labor and materials and give a building superintendent a fixed weekly or monthly compensation for ordering materials, hiring men, and generally taking complete charge of the construction work. Is the legal position of the architect any different in such cases than in the ordinary lump sum contract? Are his duties and responsibilities any different?

Generally speaking, both of these questions can be answered in the negative. However, since the architect must act as the owner's adviser in the matter as to what form of contract is most advantageous and economical under all circumstances, there are several points regarding these cost plus contracts and the relations, rights, and liabilities created by them that are worthy of some attention. In his role as the protector of the owner's pocketbook, a knowledge of the good and bad features of such contracts is essential.

The ethics of the architectural profession call for the payment of services in certain percentages of a defined cost. Thus the architect works under a form of a percentage contract. Why does he as a rule discourage this familiar form of contract for the contractor? The predominant reason as given by the contractors is that since they favor it, the architects must necessarily disapprove. Today the two real reasons for the architect's position on this subject are: first, the distrust of the contractors due to their reputation in the past; and, secondly, the fact that the architect has much more detail work in his superintendence under the cost plus contracts than in the usual uniform contract. He must keep more assistants on the work to properly check the costs of materials, labor, etc. This also requires more time of the architect himself, since he must keep closely in touch with his assistants and with the work so that he may know that they are not being misled or deceived. Are there not advantages to the owner which should ordinarily make him glad to pay for the architect's extra help and somewhat more, if required, for the extra personal service?

Under the lump sum contract, when the contractor finds that he has a losing job, he naturally does everything to save himself. He is especially keen on trying to get the architect or the owner in a position where he can stop the work and claim a breach of the contract. If his losses are going to be large, the work is stopped and he takes his chance in a lawsuit with the owner. There are always constant quarrels between the architect and contractor as to what the specifications mean or specify and as to whether certain work is, or is not, proper under the contract. The owner is neces-

sarily drawn into the differences and the unhappiness caused can hardly be measured in financial terms. It would seem that the use of the percentage contract with a maximum limit of liability for the owner would assure the latter more nearly what he wants and what he is paying for, provided the architect gives the work the proper supervision for that kind of a contract. It should eliminate the trials and tribulations above enumerated for both the architect and owner, and in addition save the owner from the burdensome and costly completion after defaults with the inevitable lawsuits and their attendant expense and delay. It should cause the architect and contractor to vie with each other to see that the owner gets exactly what he wants instead of making them the enemies they are ordinarily. It should be noted that this form of contract increases the competition between the large corporations with heavy overhead expenses and the little contractor whose office is in his house, since the percentage paid has to cover these items in both cases. Until some more accurate determination of contract work becomes fashionable, such as the widely suggested quantity-surveying plan, there is no question but that under ordinary circumstances a properly drawn cost plus contract is the most advantageous for all concerned. The owner's special plea for economy and cheapness must be governed by the definition of "cost," by the percentage or fixed sum paid, and by a maximum liability under all contingencies.

Cost of Work. As the architect has found in his own contracts for services, there is one point that cannot be too carefully stated and understood, namely, what elements are to be considered in the "cost" upon which the percentage is based. A case just decided covering this question involved the following facts: An architect had the usual contract for a fixed percentage based, however, on the "cost of the contracts." A contract was given for the entire work at $7,500. When the work was within three weeks of completion the owner was unable to make a payment then due the contractor. This failure of the owner, due to some difference with the loan company, gave the contractor the chance he was looking for, and he immediately declared that the owner had broken the contract and therefore he was stopping the work and would claim the value of the work done to the time of stopping. The fact was, that the contractor had known for some time that he could not complete the work for his contract price, and that if he had to continue it would cost him from $1,000 to $1,500 more than he was to receive. As the owner was in a hurry, he finally promised to pay for the unpaid materials and labor, and pay for the necessary material and labor to complete, and also a weekly salary to the contractor to act as superintendent for the completion, limiting it to three weeks. After the house was completed, believing he had a grievance against the architect, the owner refused to pay him a balance due, which resulted in the filing of a lien and an action to foreclose the same. At the trial the owner admitted that he understood that the architect was to get his percentage on the cost of the house. It was proved that the cost, with the troubles above mentioned, was $9,000, and the court held that the architect could charge his percentage on his actual cost, and that he was not restricted to what it should have cost, or $7,500, had the contractor done as he agreed to do. This case is also important in that it shows that "cost" means what it says, irrespective of the causes for its amount.

Just lately, in a very important building case, the question as to what was a reasonable percentage was raised. The experts who were called upon to give opinions upon that matter seemed to agree fairly well that 10 per cent was fair and 15 per cent a maximum, without taking into considera-

tion that the percentage must depend upon the basis or definition of "cost." Let us see if they were correct in their general opinion.

Ordinarily "cost" to the average person means only money spent at or near the construction work for foremen, mechanics, laborers, etc., and for materials actually incorporated in the construction or wasted in its construction. Such a person usually fails to remember that this does not include such actual costs to the contractor as official, engineering and clerical salaries in large firms or corporations, rent, etc., of spacious general offices, interest on money invested in office, plant, equipment, depreciation, etc. It has been found that these items for a big corporation doing large work vary from 5 per cent to 20 per cent of the "cost" of labor and material on the job. For this reason the ordinary 10 per cent upon such "cost" often represents little or no profit for the contractor, although the owner usually considers it all profit. What percentage might be fair under certain circumstances is well illustrated by a rather late case in the West.

The laws of a certain western state provide that the state shall pay for excavation of waterways and filling in of tide lands at cost plus 15 per cent. A state contractor for this work sublet his filling work to a subcontractor at 15 cents per cubic yard. The contractor's supervision, engineering, etc., cost him 1 cent per cubic yard, so that this basis of 16 cents was certified as the cost to which the 15 per cent was added. When the assessments were attempted to be collected, they were resisted and in the resulting lawsuit it was proven that the actual cost to the subcontractor to do the work was but 12 cents, giving them a 3-cent profit. The first court held that the cost heretofore certified should be reduced by this 3-cent profit; but the Supreme Court held that the cost was 16 cents to the contractor, and there being no proof of any fraud, he was entitled to use that as the basis for the calculation of his percentage of profit. Thus instead of paying what was supposed to be 15 per cent of cost, the failure to stipulate that there should be no subcontracting unless the subcontractor's cost should be considered the contractor's cost, caused the state to pay 38 per cent upon the "actual cost," or 53 per cent upon the "cost" as that term is ordinarily considered. Yet, as was fell said in that case, there was no showing but what this was a fair charge for the state to pay for the work.

This failure to prevent subcontracting is even more strongly shown in a New York case where a contractor on a cost plus 10 per cent contract was held to be entitled to charge his 10 per cent on various subcontracts which he had given to the subcontractors at their cost plus 10 per cent. In other words, he actually collected 21 per cent on the "cost" to the subcontractor. In still another case an interesting conclusion was reached. A railroad grading contract provided that the contractor was to receive payment of wages for actual labor, payments for powder and fuses plus 10 per cent of said amounts which were to be in full for all advances, shanties, pay of foremen above ordinary labor, general supervision, clerk hire, agents, personal care, etc. Upon receiving the contract, part was sublet and the contractor charged his 10 per cent upon the subcontractors' charges to him. The court held that since there was no specification against subletting, and as "wages" might be paid either for time or piece work, hence payment made to subcontractors were "wages" for actual labor upon which he could properly charge his 10 per cent.

These are but a few of the cases which show that as a matter of fact 10 per cent upon the usual basis of "cost" is really a very small percentage, which ordinarily would give the contractor little or no real profit. These cases also show that an owner may pay from 20 per cent to even 50 per cent

on the usual "cost," and yet only pay what the work is reasonably worth. In this connection the owner eliminates the extra charge which a contractor always adds to his bid to take care of unknown contingencies. As a matter of policy, it is naturally much preferable to make the defined "cost" include all possible expenses of every nature and keep the percentage down, although for purposes of giving a greater range to competitive bids it may at times be deemed otherwise.

These cases thus show that the protection of the owner depends largely upon the contract provisions regarding subletting. Of course a general contractor must be permitted to subcontract his plumbing work, since that class of work is in many cities restricted to registered and licensed plumbers. Again, a general contractor who makes a specialty of foundations and mason work should be permitted to subcontract his steel work, since he could not possibly do that character of work as cheaply as the others making that a specialty. Hence this is where the architect should be given some discretion to approve or disprove of subcontracts and their amounts, since the cost to the owner depends so largely upon such subcontracts.

The care with which the definition of "cost" must be scrutinized is well shown by a very late case in which the "cost" was fully defined, but unfortunately for the owner contained the phrase "cost of accidents." During the work an employee of the contractor's was badly hurt and recovered judgment against them of $27,000. As this award was affirmed upon appeal the company had to pay, and they then asked the owner to reimburse them as it was part of the defined cost. The owner refused on the ground that it was not reasonable to charge him with such a judgment under the wording mentioned. However, the court ruled against him and held that the interpretation of the phrase by the company was correct and the owner must pay.

While these suggestions and cases show that the cost plus contract has its pitfalls for the owner, yet there are really very few of serious import, and the advantages suggested are so great that there are times when it would undoubtedly be of advantage to the architect to use this form of contract.

Architect's Duties. As has been previously stated, there is practically no difference between the architect's duties under the cost plus form as differentiated from the lump sum form. This is well illustrated in a late case where the owner refused to pay a contractor because the side walls were not watertight and because the same condition existed in the roof and around the windows. The contract was a percentage contract and the proof showed that the contractor had carefully followed the plans and specifications of the architect, which were very detailed. The court held that as far as the contractor was concerned the owner warranted the sufficiency of the plans, and hence there was no liability against the contractor on these scores. That opinion also meant that the owner could probably recover against the architect for the insufficiency of his professional work.

Hence we can take it as our general rule that the architect has the same liabilities and duties under these forms of contract as under the lump sum contract.

Relation of Owner and Contractor. There are times when it is essential that the architect should know whether the party doing the construction work is a so-called independent contractor or merely the agent of the owner. That question has been the subject of probably as much litigation

as any other one matter, especially where questions of liability for accidents have been involved.

Clearly in our third form of cost plus contract suggested at the commencement of this article, where the owner hires a building superintendent only, the relation created would be master and servant. In such a relationship the owner becomes responsible for accidents and also for the result of the work. Some illustrations will show the differences in the relations. Where an owner made a contract with two partners to furnish teams and men for certain work, one of the partners to be always present as foreman under the direction of the owner's foreman; where the partners received pay as foremen at a certain sum per day and the men, materials, and expenses were paid for at cost and bills rendered therefor with a certain percentage added for profit, the court held that the partners were the servants of the owner. On the other hand, where a contractor enters into an agreement with the owner whereby he engages to purchase the material, employ the labor, and superintend and erect a building pursuant to plans in hand; where the contractor is to render a true account of purchases and payrolls, to use his best endeavors to secure material and labor at the lowest prices and guarantees that the workmanship shall be first class; where the owner is to pay the estimated net cost of materials and labor and a fixed sum called a commission, the court held that such a contractor was an independent contractor and hence he alone could sue a third person for the damages resulting from the negligent construction of a portion of the building under a contract made with him.

The test has been said to be, "Who has the general control of the work? Who has the right to direct what shall be done and how to do it?" Yet it has been held time and again that the right reserved to an owner to discharge any workman does not make the contractor a servant, and the same is true of the privilege of inspecting and supervising the work. It is only when the owner can and does attend to the details that the relation of master and servant is created. The mere fact that there is no contract and no plans, and that the person employed to do the work is paid by the day, does not create the relation of master and servant where the person is employed to accomplish a certain object, the mode, manner, and means being left entirely to the person's skill and judgment.

Thus we see that generally there is no more chance of the owner becoming a master and hence responsible for accidents, etc., in cost plus contracts than in the usual lump sum form. As this fear often causes the owner to refuse to use the cost plus form where it should be used, it is hoped that this may allay such suspicions and doubts.

Conclusions. Our considerations would seem to show that the cost plus contracts have advantages which some architects and owners have failed to take into account. Especially where it is used in connection with a maximum limit of cost it should give the best satisfaction to all concerned unless some means of accurate quantity surveying with a suitable contract is used, or unless the contractor or architect is dishonest. The owner may be safeguarded by the architect's careful attention to the following items: the contract definition of cost; the contract provisions regarding the percentage or fixed sum to be paid, subcontracts, maximum limit of owner's liability, and constant supervision with honest and accurate checking of all costs. If the owner were assured of the saving both in money and annoyance which is possible with this form of contract, he should be willing to pay the architect a greater compensation for his increased services, and also the additional expenses necessary for the proper checking of the contractor's figures.

The Responsibility for Incompetence

MR. KRUSE'S paper on "The High Cost of Incompetence," which was printed in the January Architect and Engineer, with comments by Mr. F. W. Fitzpatrick, consulting architect of Washington, has provoked some bitter denunciation of the writers of these articles from members of the profession all over the coast. If we were to publish the flood of letters, pro and con, it would make interesting reading, indeed. An owner in Portland writes even more forcibly than Mr. Kruse. Mr. Kruse himself thinks that he may not have made himself quite plain in some of his statements.

"It is possible," he says, "that the article will be misconstrued by certain members of your profession, and in such event I will be glad to reply to any questions that they may see fit to propound. In my opinion the subject under discussion is one of vital interest to both the owner and to the architectural profession. It is true the article does not state all the facts."

William Mooser, former president of San Francisco Chapter of the American Institute of Architects, was shown Mr. Kruse's article before it was printed. After reading it Mr. Mooser wrote us as follows:

"Personally I cannot see any reason for withholding its publication. Of course it can be answered, and no doubt will be. I cannot see where the architect is any different professionally than the lawyer. Think of a man having a case involving hundreds of thousands of dollars, employing an incompetent lawyer—loses case—where's the redress? The same applies to the physician—patient dies—but where is the redress?"

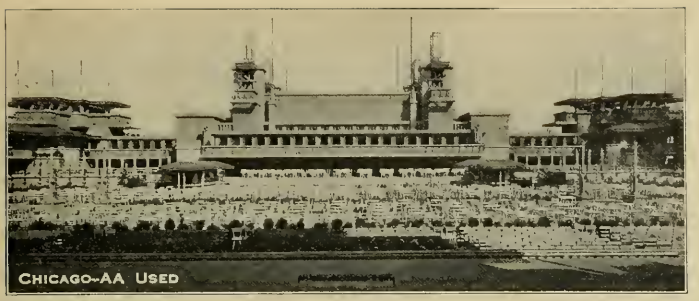
Mr. Frederick L. Ackerman, chairman of the Committee on Public Information of the American Institute of Architects, takes exactly the stand advocated by this magazine, that "a rigid license law (properly enforced) should prevail in every State, making the requirements for admission to practice most stringent, and thereby ridding the architectural profession of incompetents." Mr. Ackerman goes on to say:

"The architect of repute desires a license law which will require and insist upon competency in all of his functions, not a part already provided for by other ordinances. Not until our courts and legislatures provide laws which recognize the essential functions of the architect can the owner hope for any material aid from that source.

"Integrity cannot be legislated into a profession any more than righteousness can be legislated into an unrighteous people. The American Institute of Architects is actually accomplishing a great deal toward elevating the standards of practice of the whole profession, but its powers are indeed small when compared with those possessed by that great group—the clients. Upon those who build rests equally the burden of elevating the standards of practice. This cannot be done by ruthlessly destroying the whole fabric which the Institute has built up through years of effort. Through more business-like methods in selecting an architect, and a more thoughtful consideration of the aims of his profession, can the standard of architectural practice and building be elevated. Just so long as the architect is chosen upon the basis of price alone, or just so long as he is chosen regardless of qualifications and professional standing—so long will there exist a group of dissatisfied clients belaboring the entire architectural profession."

* * *

The steamer Manchuria brought from China in the latter part of September, 140 tons of building material, artistic wood carving and special fittings for the Chinese pavilion and temple at the Exposition.



GENERAL VIEW OF WINTER GARDEN, CHICAGO

The Aesthetic in Concrete

THE widespread use of Portland cement concrete in heavy foundation work, piers and abutments, warehouses, factory buildings, streets and roads, has led many people to believe that concrete is adaptable only to the heavier types of construction, and entirely unsuited for finer craftsmanship.

When consideration is taken of the fact that Portland cement is comparatively a new material and that it has been generally used only one decade, it is not surprising that greater advances have not been made in the use of Portland cement as a decorative material.

It is a fact that concrete is almost an ideal material for ornamental uses and elaborate designs. Concrete lends itself most readily to duplication. While the possibilities of concrete in ornamental work are almost unlimited, the scarcity of good examples of such work are largely due to the scarcity of artisans with ability to plan and execute ornamental structures. However, a few examples of decorative concrete which have been produced within the last few years, have been an incentive to architects and builders to experiment with Portland cement, and it is safe to say that great advances of an aesthetic nature will be noted from now on.

One of the latest examples of beauty and utility in concrete is the Midway Gardens in Chicago. This structure is doubtless the most unique architectural conception in the world.

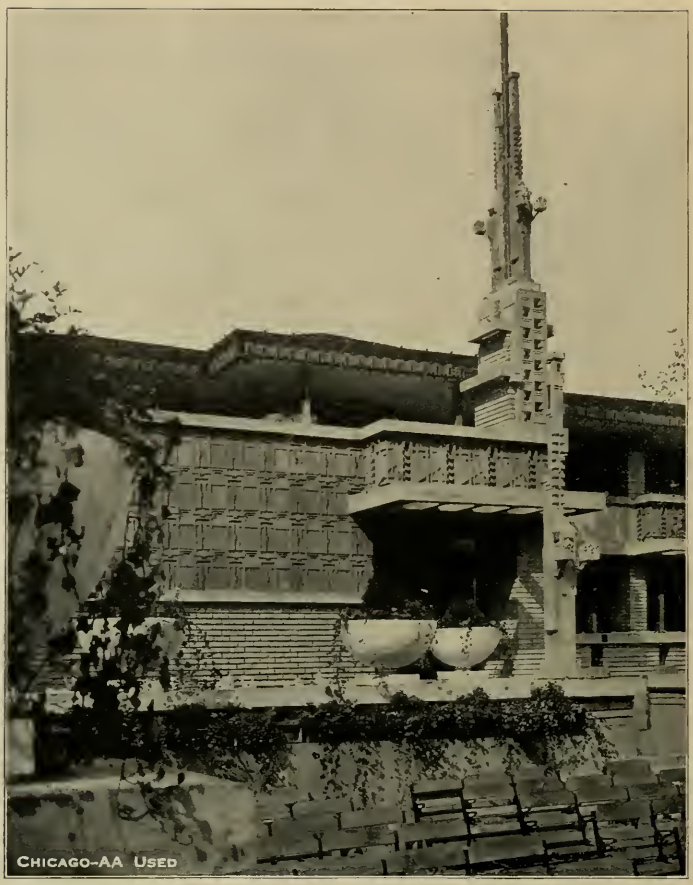
Mr. Frank Lloyd Wright designed the Midway Gardens and Mr. A. Iannelli supervised the modeling of figures and panels.

In idea, the Midway Gardens are modeled after the gardens of Germany and other Continental European countries. Instead of the stiff rows of benches which have characterized other American parks of similar intent, the interior court is dotted with small white tables and chairs at which the audience may supplement its appreciation of music with a cooling glass or a comforting supper.

Architecturally, the gardens are modeled after nothing European. They are not an attempt to reproduce a Greek temple or a Swiss chalet, but are purely and originally American. They bear upon them unmistakably the stamp of their architect, Frank Lloyd Wright, with their continuous horizontal lines and low, broad overhanging eaves. Throughout the whole, concrete is the predominating feature. Some of the walls and columns are partly of cream colored brick, setting off the grey concrete work admirably, but the construction is fundamentally concrete. And the most wonderful part of it all, is the intricacy of some of the designs executed in concrete—elaborate sculpture with something of the oriental suggested in its delicate traceries. Those who see in concrete only a material to be used in bulky masses will be confounded by the results achieved here.

DECORATIVE SCULPTURE "QUEEN OF THE GARDENS" MAIN CORNICE OF WINTER GARDEN, CHICAGO
FRANK LLOYD WRIGHT, ARCHITECT

ARCADE BALCONY, SHOWING DETAILS OF CONSTRUCTION
FRANK LLOYD WRIGHT, ARCHITECT

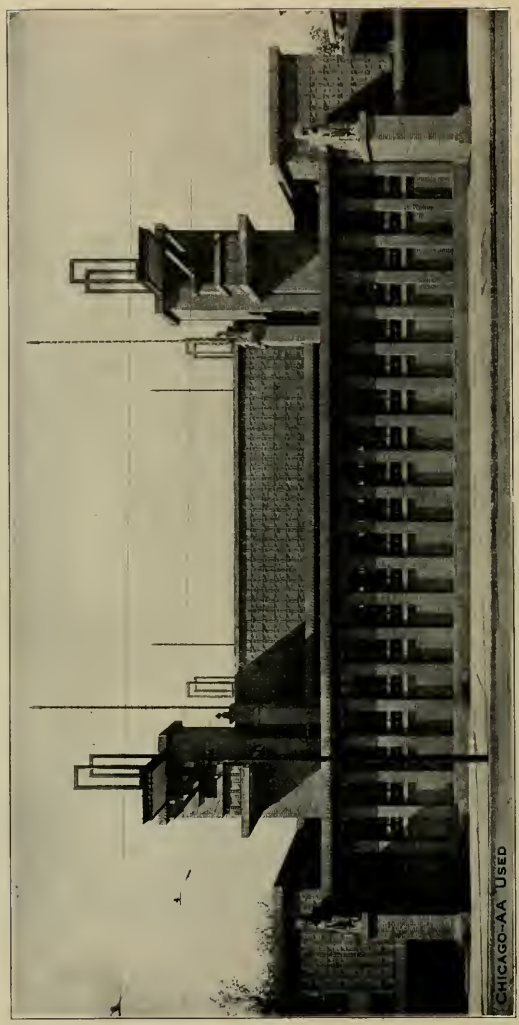


CORNER OF SUMMER GARDEN, SHOWING ARCADE TERMINAL AND ORNAMENTAL LIGHT POLE
FRANK LLOYD WRIGHT, ARCHITECT

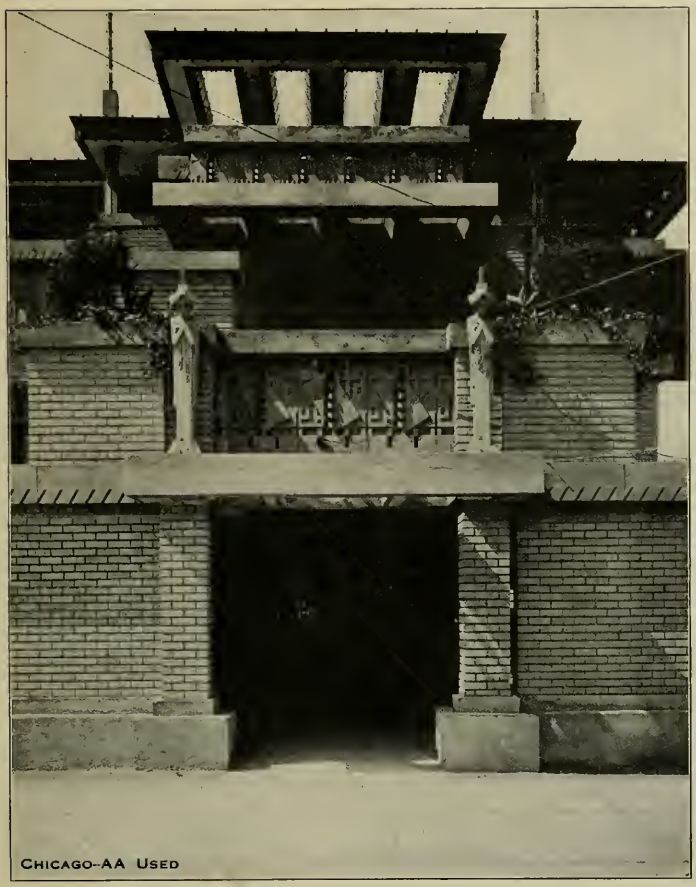
COLORED DECORATION ON NATURAL CEMENT PLASTER IN TAVERN, MIDWAY GARDENS, CHICAGO
FRANK LLOYD WRIGHT, ARCHITECT

SUMMER GARDEN, CHICAGO
SHOWING ORCHESTRA SHELL
FRANK LLOYD WRIGHT, ARCHITECT

SUMMER GARDEN, CHICAGO. GENERAL VIEW FROM BALCONY OVER THE SUNKEN GARDEN
FRANK LLOYD WRIGHT, ARCHITECT



WINTER GARDEN, TOWERS UNFINISHED
FRANK LLOYD WRIGHT, ARCHITECT



ENTRANCE TO MIDWAY GARDENS, CHICAGO
FRANK LLOYD WRIGHT, ARCHITECT

DECORATIVE SCULPTURE AT MIDWAY GARDENS, CHICAGO
Frank Lloyd Wright, Architect

Professional Courses in Landscape Gardening at the University of California

By PROFESSOR JOHN W. GREGG

LANDSCAPE gardening, often called landscape architecture, or landscape engineering, is the art of improving land for human use and enjoyment in such a manner as to secure the maximum of beauty combined with the maximum of practical utility. It is now recognized as a most pleasant and profitable profession in which men of ability can find congenial and useful employment. The professional course is designed to furnish instruction both theoretical and practical, so that men of artistic ability may become successful practitioners of the art or competent draughtsmen; men of business instincts may become contractors, and men of managerial ability may become foremen or superintendents of construction or maintenance. In its various phases the profession offers desirable openings for a limited number of well trained men; to untrained men, little or no opportunity.

Elementary work in landscape gardening has been offered in the College of Agriculture for a number of years, but not until January, 1913, was there a definitely prescribed professional course leading to the degree of B. S.

The work as now offered combines with the professional courses in landscape gardening, the essentials of a liberal education, aiming to give the student a broad foundation for his future work as a professional landscape architect; to this end subjects common to all courses in the College of Agriculture are considered fundamental and preparatory to those of a more highly specialized character to follow. In addition to the professional courses, instruction of an untechnical nature is offered for those who wish to become familiar with the fundamental principles governing the art, to the extent that they may be appreciative of correct design and all that is beautiful in the landscape.

As landscape architecture is now recognized as an art and as a profession, the aesthetic and practical sides of the profession are emphasized throughout the course, the practice in design being given a most important place in the schedule of courses.

The division is equipped with a very large draughting room with overhead light and furnished with all the instruments, draughting tables and other equipment necessary for strictly first-class professional work in landscape design; while on the shelves in the University Library may be found all the best literature dealing with the art in this and other countries. In addition to this literature, the division maintains in its own offices and draughting rooms other literature in the form of park, city and town planning reports, and in the Agricultural Library may be found all State and Government bulletins dealing with this and allied subjects. An herbarium of several hundred specimens especially collected and mounted for instructional purposes in plant materials, is also an important part of the equipment. This herbarium seeks to include specimens of all the latest and choice materials introduced into the State as it may show value for landscape planting.

California offers wonderful opportunities for the study at first-hand of landscape problems of all kinds, from the design of small suburban lots to the municipal parks and park systems of the larger cities, including city and town planning and real estate subdivision work. The University campus and grounds of the various sub-stations, Golden Gate Park, and the many large nurseries, all furnish opportunities for study of plant materials and their adaptability for landscape work. Considerable space on the University campus is devoted to the propagation and raising of ornamental nursery stock. It is important that one

should recognize the fact that because of the variable climatic and soil conditions as well as the extensive ornamental flora both native an exotic, that men trained in California are better able to appreciate and solve the problems in landscape design peculiar to this coast.

The requirements for admission to the four-year professional course are the same as those for the College of Agriculture, and detailed information concerning entrance requirements will be found in the various announcements of the University, which may be secured by addressing the Recorder, University of California, Berkeley, California. Students looking forward to taking landscape gardening should take, during their high school course, such subjects as French, German, Chemistry, Botany and as much freehand and instrumental drawing as possible.

In addition to the regular prescribed course for each semester, each student is required to take a summer practice course at the end of the Sophomore year for the purpose of giving them an insight into the works of their chosen profession, such work being carried on just as in actual practice.

In addition to the major subjects students are required to elect numerous allied subjects in other departments of the University. Such subjects include courses in architecture, civil engineering, botany, soils, fertilizers, entomology, plant pathology, forestry and drawing, descriptions of which may be noted in the Announcement of Courses.

In addition to the undergraduate course leading to the B. D. degree, opportunity is offered for advanced or post graduate study in "Modern Civic Art" and "City and Town Planning."

* * *

Shape of Office Buildings More Important than Height

IN the course of the campaign for the present Minneapolis ordinance limiting the height of buildings a man who was a student of office building problems advanced the proposition that it is better, cheaper and more profitable to carefully shape buildings to the lots they are to occupy than to limit the height of the structures. Virtually he advocated no limit, but he insisted on careful planning which would give every user of the building all possible light and ventilation. This man was W. L. Brackett, of Minneapolis, who at that time seemed about to carry to success a project for a modern twenty-five-story office building on the corner of Second avenue South and Fourth street. The outbreak of war in Europe caused a postponement of the enterprise.

There are three types of high buildings for downtown business purposes, according to Mr. Brackett—the L-shaped, the I-shaped and the T-shaped. There is no doubt whatever in his mind that the only shape which will stand all tests of scientific examination for utility, light, air, desirability of space, least cost of construction per foot of space, economy of operation, and finally, profit on the investment, is the L-shape.

The chief claims for the superiority of the L-shaped structure for a corner lot are: That it gives the great amount of floor area susceptible of proper lighting; that it is more economical to build; that it is so much better than an E-shaped or U-shaped building that there is no comparison, but on the contrary, a sharp contrast of attractive office space because in the L-shaped building all offices are outside offices. These advantages produce a greater rental. The L-shaped building is more nearly independent of adjacent buildings than any other kind. The same area as in buildings occupying more ground space is produced without more outlay by making

it higher; that is, a seventeen-story, L-shaped building, according to Mr. Brackett, will cost no more than a twelve-story U-shaped or E-shaped structure and yet produce more rental since all the offices would be light and desirable, and a great deal more general satisfaction among the patrons.

Mr. Brackett maintains that it is unscientific and unprofitable, both for tenants and for general city conditions to create conditions in a business building which compel the occupants to use artificial light a great deal or all the time. It is a serious mistake from any point of view to do this when, by a little more effort and scientific study of the problem a building can be erected which will furnish bright and attractive rooms for all.

* * *

Does it Pay a Contractor to Advertise?

"WE don't need to advertise. An advertisement won't bring us a job. It's the man with the sharp pencil that lands nowadays."

It was a big San Francisco contractor speaking. He went on:

"They all know me—the architects, I mean. I've been in the game for years. No, I have no office in Los Angeles or up in Portland, but I'd figure a job in either place if it looked good to me."

This fellow may understand the contracting game, all right, but he's got a lot to learn about other things. He thinks they all know him because he has been in the game since before the San Francisco earthquake and fire. Wonder if he ever stopped to think how many new architects have come into the field since then. It's a safe bet that ten out of twelve of these newcomers never heard of this "well-known pioneer builder," as he is wont to style himself.

"The architects don't read the ads any way," this fellow went on. "They look at the pictures."

They don't read the ads, eh? Well, they do. A Fresno architect who does quite a little figuring in the course of a year dropped into our office the other day. Beneath his arm he carried a late issue of The Architect and Engineer. He had a lot of the advertising pages turned down and a blue pencil mark indicated the addresses of firms he intended to call upon while in the city to have them figure some plans. That's only a single instance to prove that an advertiser is getting something in return for his investment—though it is oftentimes extremely difficult for him to appreciate it.

The other day one of the biggest architects in San Francisco called us up on the 'phone.

"I've been looking through my copies of The Architect and Engineer," he said, "and can find but one San Francisco contractor who maintains a Los Angeles office. Do you know of any other San Francisco builder who figures work in Southern California? I have a big job down there that I want figured."

We thought of the contractor who was so well known that he didn't need to advertise and who would figure on Los Angeles or Portland work if he got the chance. We gave the architect his name.

"Why, how funny," said the architect, "I never heard of the man before. Has he done much building?"

We hope this contractor will read this. Maybe it will take some of the "importance" out of him, and we hope the contractors who are advertising with us will read it, too. It should convince them of the value of publicity.

A Uniform Building Code

By F. W. FITZPATRICK.

IT HAS taken just twenty-five years of most insistent pounding to thoroughly awaken this country to the fact that fire-destruction was wholly unnecessary and constituted one of the gravest menaces confronting the country and an unbearable tax upon its resources. This work of arousing has been well enough done so that today there are national and state and municipal fire-prevention societies doing splendid work everywhere, nearly all our states have established fire marshals' offices, there are journals devoted entirely to the advancement of fire protection, the other technical journals give much space to fire protection and the daily press devotes frequent and well written editorials to the work. There is no question but that the subject has been well agitated and that curative measures have to a degree been applied and still others right at hand.

One of the hardest tasks in connection with this matter has been to make people forget that fire extinction was the sole salvation. For years, municipal ambition has been to increase the efficiency and size of fire departments. Fire seemed inevitable and to put it out the only cure. And so very much that is combustible in the way of construction has been allowed that in very truth it is now almost impossible to stay the progress of fire, in large chunks of conflagration, until vast numbers of poorly built structures have been wiped out of existence by fire or voluntarily removed. So that highly organized fire departments are indeed most important. But, and that only within the last ten years, it has at last penetrated our national intelligence that if we couldn't absolutely prevent fire in the old fire traps we could at least not continue adding to them and that therein was the real spirit of fire prevention. And it was about time that this discovery should be made. We have reached, by reason of the poor construction that has been tolerated, a pretty lofty pinnacle in the matter of fire destruction. A couple of thousand lives a year is not an unusual sacrifice, $250,000,000 worth of property burnt up, an average annual offering to the fire god, plus $300,000,000 for the maintenance of fire departments, public and private, water service and all that sort of thing, and then about $200,000,000 a year more carried in to the insurance offices as premiums over and above the amount returned to the sufferers by fire in paid losses!

To insure that there will be no additions made to our burnable construction it is also recognized that strict building regulations have to be written and enforced by state and municipality. This, sad to relate, is bound to involve some "politics." The authorities may fully realize the importance of the matter and that most drastic regulations are necessary, but they fear the results of enforcing that sort of thing. It might mean the incurring of the enmity of so-and-so or the other one who is interested in shabby construction, a jerry-builder, but one with political influence, so building regulations are usually gone at in a half-hearted way and the authorities seek to devise and apply not what is really needed, what is necessary, but merely what "the people will stand for."

Just so soon as the revision of a building code is thought of or suggested, up goes a mighty howl, people declare the cost of building will be prohibitive, "improvements" to property cannot be made, it will be a hardship upon the poor man, it will raise rents and endless other knocks will be administered, foolish arguments, pure rot. There has always been opposition to progress, the locomotive and automobile were fought by horse dealers, the telegraph and the telephone were opposed, curative liquor

legislation is fought tooth and nail by the liquor interests, and so it will always be with better building. It is opposed by the shysters who profit by inferior construction, the speculative builders, the jerry-men who build so that a house is literally held together by the paper on the walls, but so long as it stands up until it is sold to a gullible greenhorn then is it indeed all right. And these are the men who make the people generally believe that safe, reasonable building regulations are burdensome!

Perfect building is absolute economy; fairly good construction is but a half-way measure and shoddy building is a criminal extravagance. That basic fact must ever be faced in devising regulations. A city full of good buildings means lessened maintenance cost for each owner, fewer repairs, a longer life for the buildings, much less tax for the maintenance of the fire department and that much less contribution to the swelling dividends of the insurance barons. It would mean millions of dollars saved, a great municipal problem solved and the lowering of rents generally, a boon, salvation to the life and property of both rich and poor. A city is but an aggregation of buildings and how can a city be a first class affair if it is filled with sixth class structures? And most of our cities are in greater part built up of not only sixth but tenth and twentieth class affairs.

Now, when a state or city makes up its mind to adopt a new code or to revise the old one the usual procedure is to appoint a committee, an architect, a builder, a sanitary engineer, or plumber, a couple of business men and perhaps a horse doctor to do the work, well-intentioned fellows in their lines, perhaps even experts, but almost invariably men who have had little or nothing to do with fire prevention and who wouldn't know a code if they met it on the street, but perfectly willing to jump right in where angels would fear to tread. Endowed with brief authority they pull and twist the poor code thus and so and finally it is jammed through the legislative body and becomes a law, in 85 out of 100 cases an ill-devised law, silly in most of its requirements and inoperative, something that anyone can get around and really more of a hampering log than a benefit to building, and I venture to assert that the great bulk of building regulations in the country today is conceived in ignorance and carried out in perhaps still greater stupidity.

It very largely comes about from our too great fondness for liberty, the battle cry of the American people and that has led us into many a pitfall. It is beautiful to have an independent spirit, but it does certainly lead to all kinds of tribulations. Each state has, for instance, jammed through its divorce law, to suit some particular condition or legislator and utterly regardless of what the other states are doing, and we have a jumble of divorce legislation that is simply immoral in consequence and that is working chaos in our social structure. As fool and diversified regulations hamper railroad travel. You may have a car window open in one state and not in another; you may guzzle to your heart's content passing through one county and not have a drop of liquor even for sickness while going through the next one. Everywhere and in everything have regulations run riot. In the administration of law, in a thousand ways are our daily lives pestered by the lack of uniformity in the great essentials of the controlling forces that should properly regulate the routine of that life. In no branch is there as great diversity as there is in the building regulations and in few other affairs should there be greater uniformity. It is so essentially an interstate matter. Transportation is so easy that the manufacture of building materials is no longer a local enterprise, but is centralized at great shipping points, hence the need for recognizing uniform standards for those

building materials; builders and investors are interested in construction in many states and cities and everywhere are they confronted by fresh and puzzling building regulations. It's all a jumble, a hodge-podge, and there certainly exists a most crying need that building regulations be properly codified and uniformly adopted throughout the land.

Why should a twelve-inch brick wall be allowed to carry so many tons load in one city and so many tons more in a town ten miles away? Look at the thing detail by detail and any layman, however unfamiliar with construction, cannot fail to recognize how ridiculous the present lack of uniformity really is.

Instead of the usual mode of procedure in such matters, the appointing of a local committee to revise the building code, there should be made a united effort to have the states pass uniform state building regulations that will control in every city and in every burg throughout each state. Then if above and beyond that any city wants to have more stringent regulations, in its endeavor to shine pre-eminently in the perfection of its buildings, well and good. But, basically, there would be a common, uniform law. Federal regulations, as have been suggested, might perhaps be the ideal solution of the problem, but there is a constitutional barrier to such and regulations of that nature must emanate from state or municipal authorities.

The National Board of Underwriters and other societies of experts have worked zealously and for years to devise such a code as could be uniformly adopted. The latest model code published is the one devised by the International Society of Building Commissioners. It incorporates the best of everything that has gone on before and is the work not of any haphazard and inexperienced committee but of experts who have given a lifetime to the study and practical administration of such laws. The writing of the Code was begun just twenty-seven years ago and is virtually the cumulative cyclopedia of building information that has been compiled during that period then boiled down and put in tersest form so as to be of as restricted compass as possible, regulations easily understood, easily administered and that would produce the very best results. Most of the other codes that have been at different times urged for adoption are cumbersome, too academic and involved. Naturally, I prefer and most earnestly urge this one with which I have had so much to do, but I also most earnestly believe that any uniform law is better than no uniformity at all and if the powers that be prefer some other code, that adopted by Chicago for instance, or the one that is pending now in New York or the Ohio state laws, well and good, let us vote for it, let us unite on something, but in heaven's name let us make an end of the present jumbly mess of regulations that confront us anew every few miles of our terrestrial journey.

* * *

Hardware!

Hardware is the jewelry of the house fabric. Under ordinary circumstances its pattern and choice are governed by the same principal that govern the jewelry of a gentleman: it must be simple, of excellent design and utilitarian. If the jewelry is other than that, the chances are that it is a little outward indication that the gentleman is but a "gent."—House and Garden.

We've often wondered whether "hardware" didn't derive its name, in the first place, from the hard things folks found to say about the men who selected it.—Philadelphia Builder's Guide.

The Building of It

By HENRY A. HOYT

THE transformation of a piece of the shore of the bay of San Francisco from its natural contour to the present state of architectural and horticultural beauty, as exemplified in the Panama-Pacific Exposition, was not entirely an easy task. Only one who has followed the triumphant building of this great fair, step by step, week by week, from its ground-breaking to the present state of completion, can appreciate the remarkable and rapid growth. Other expositions have had at least terra firma to build on; this stands largely on filled soil, within a very few feet of the waters of the Pacific. This, in itself, was quite an obstacle that has, however, been easily overcome.

A prominent official of the exposition stated publicly recently that "This Fair has been built and developed by the press." In other words, he gives the credit of success to what we call publicity. This word has become very important in recent years and is now a national by-word with a very well understood and conveyed meaning. The fact is, the whole exposition itself is nothing but a great big piece of publicity, or to speak more plainly, a great big advertising scheme.

As an achievement, it is a Coast product, a California exploit, another San Francisco triumph!

A great degree of the credit for the building of this wonderful fair has not publicly been placed or acknowledged. The writer refers to the vast army of men who directly or indirectly brought about the actual building of it; contractors, subcontractors, material men, engineers, superintendents and finally, the actual workmen themselves who really wrought it out with head and hands. We speak out here on the Coast of *general contractors,* but to use a war term we might consistently call them *contracting generals.*

With remarkably few exceptions, the same men who rebuilt San Francisco after 1906 built the fair. At least it can be said that it was erected by San Francisco builders, and the exceptions to this statement will be proud to be classed with the building fraternity of the city.

The writer has been told by builders who have been connected with the construction of other great fairs that our exposition is "too well built." Another credit mark to those who designed and built it. A well-known publisher of the East viewed the fair a few days ago and his first expression was one of regret that it had to be "temporary."

The builders of this exposition are a modest lot of fellows. They have done their duty well, with little noise and too little publicity. They have signed their contracts, put a roll of blue prints under their arm and gone out to the filled sand lot, erected a little field office, and proceeded to organize a force and "get busy." If they lost money, few have heard of it, and likewise, if they made money they put it in their pockets and said nothing.

The average visitor to the fair this year will admire the buildings, will marvel at their size, their beauty of color, their architectural completeness and perfection, but few will see the buildings as they stand from a real builder's viewpoint. To the small number who do it will be a great treat and an inspiration to go and do greater and better things as builders.

Lumbermen from the Middle West and elsewhere will admire the size and strength of the native timbers from which all the buildings are constructed. Any real builder, using the term in its broadest sense, will find his eyes wandering away from the exhibits upwards to the structure itself. Mental estimates of quantities will be made, but naturally will be very inaccurate. For instance, it will be hard to realize that the great Machinery Hall has over 7,000,000

feet of good lumber embodied in its great frame. Incidentally, it took sixteen hundred tons of bolts and truss rods to properly and safely tie it together, to say nothing of a few carloads of spikes and nails. Nearly 1,700 tons of structural steel went into the famous Tower of Jewels. That great glass dome of the beautiful Palace of Horticulture has about twenty-five thousand square feet of wire glass in it, or somewhere around forty-four tons of glass.

The barn builders of the great agricultural districts of the country will appreciate "plank-framing," and balloon framing and truss construction out at the fair. If they do not get it all covered up with the finish, the peculiar strength and bolting of the beautiful Argentine building will interest and enlighten. The writer would dislike to fall into the hole created in Nevada and Utah by the tons and tons of plaster used to cover the frames of all the buildings. One roofing concern estimated the roofing of their make used in "acres" and not in the usual measure of "squares."

It is needless to say that we of the Coast who have to do with the building business in one way or another are proud of the fair, and proud of those who built it.

* * *

Lessons from the Edison Fire

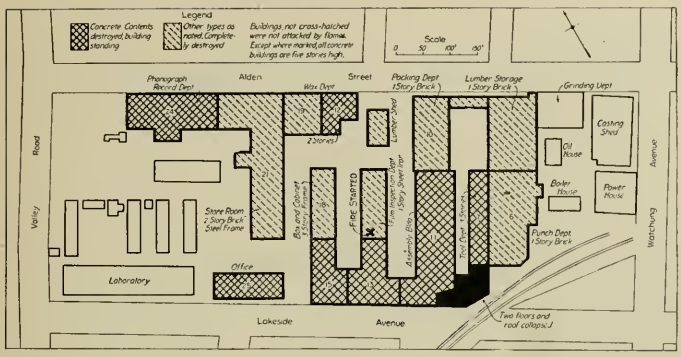
IT may be ventured that no occurrence of the kind in recent years has attracted more attention in constructional circles than the fire early in December which destroyed the greater part of the Edison plant at West Orange, N. J.

The fire started in the Film Inspection building—a one-story sheet iron structure located in about the center of the plant. The contents of this building were highly inflammable, and the fire spread rapidly to the adjoining buildings. The principal reasons assigned for the extent of the disaster are interesting in view of the manner in which an examination of the structures showed the small damage sustained by the concrete buildings. The experts employed to make a survey after the fire reported 87½ per cent of the concrete construction in first-class condition. The damage was attributed to: (1) the highly inflammable character of the contents of the building; (2) the inadequacy of the water supply; (3) the fact that the window openings were fitted with wooden sashes and plain glass; (4) lack of fire walls; (5) lack of automatic sprinklers.

The plan reproduced herewith shows the location and type of the buildings at the plant. With the exception of certain sections in Buildings 24, 15 and 11, the concrete buildings were found in good condition. They were all standing, and the salvage of the contents will be large. This is held in marked contrast to the brick structures, where the collapse of the buildings resulted in heavy loss of contents.

The following comment on the lack of proper fire-prevention measures is made editorially by the Engineering Record:

"While chief interest would seem to center in the performance of the concrete buildings, the most important conclusion is a costly verification of one of the fundamentals of fire protection practice. This conclusion should be preached from the house-tops—that when structures are exposed to fire hazard from without it is folly to place one's trust in "fireproof" buildings fitted with wooden window sash and plain glass. The ruin at West Orange, thrown in relief by being linked with the great inventor's name, preaches that lesson to the matter-of-fact executive more strongly than all the fire-prevention documents ever written. Here was a plant



LOCATION AND TYPE OF BUILDINGS AT THE EDISON PLANT

with closely spaced buildings, all of them without the fire-protection provisions which long experience has demonstrated to be essential for the safeguarding of such structures. Moreover, there were no fire walls to prevent the spread of the flames from one adjoining building to the next, and none of the buildings were equipped with automatic sprinklers. The concrete buildings were considered "fireproof," but can be called so only by courtesy. They were not fireproof, except in the sense that they themselves would not burn. They were virtually concrete stoves, with tinder at every window inviting the application of the torch.

"As for the performance of the concrete buildings in so severe a test, one can happily report that they came through very well. It is safe to say that four of the seven are in their entirety usable. In two of the remaining buildings the damage is local, affecting parts of four floors, while in the third the columns in the first floor are in very bad condition."

* * *

One Meaning of Brick

IT is no mean testimony to the value of the first of all building materials that to call a man a "brick" is about the highest compliment we can pay him. Franklin Matthews, an American war correspondent, while stationed near Mukden, met Field Marshal Oyama, and became so impressed with his personality and excellent education that he wrote a two-hundred word cablegram home, in which, among other things, he said: "I find Marshal Oyama a brick." This was sent to the interpreter, who translated it in Japanese and sent both copies to the army censor. That afternoon Matthews was questioned by the commanding captain regarding the cablegram, and especially concerning the expression, "You are a brick." Matthews explained to him that in America when you called a man a "brick" you meant that he was a "splendid chap—fair and square, and all that." The captain smiled the Japanese smile and said: "Your interpreter was very clumsy. He translated the word 'brick' literally, making it read 'a lump of dried mud,' which puzzled me greatly. I am glad of your explanation."

BLOCK PLAN, CITY OF CALGARY

City Planning and Housing

Edited by CHARLES HENRY CHENEY

Purpose of this Department

THIS department is aimed to call attention to the important advances in city planning and housing taking place in the world, and we shall endeavor to bring to your notice the principal City Planning Reports as they are issued, current comments in the various periodicals and other publications, and reviews of such books as seem worth while.

While architects have displayed their chief interest in city planning and housing on the æsthetic side of the problem, we know that few schemes can be put into practical execution without an equal presentation and study of the economic and social sides.

We propose to offer in illustrations the latest city plans, civic centers and housing solutions to answer aesthetic interest, and publish brief summaries of economic reports and social surveys. The history of well executed city planning and housing schemes everywhere shows that a strong "social sense" is necessary to the successful handling of these problems.

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The illustrations for this month are taken from a preliminary city plan report on Calgary, Canada, by Thomas H. Mawson & Sons, English city planning experts. This report will be reviewed in a later number.

* * * *

Business Slums

The safety of your health is determined not by your own mode of living, but by that of your worst housed and poorest neighbor. You must be the keeper of your neighbor's health in order to safeguard your own and that of those nearest to you.

There are in our cities business as well as residential slums. Skyscrapers in which thousands of people work without proper air and light are as dangerous as houses in the building of which light and air are not the first consideration.

Industry, business and home life may flourish in the same community if they are distributed according to an intelligent community plan. Without a plan, moral, sanitary and economic slums are created.

Wage earners are seeking the peace and comfort of the exclusive suburban communities. Their ignorance and the speculator's greed are bringing the slums into the open country. Not to prevent this is wasteful for the present and unjust to the future.—Dr. Carol Aronovici, in Town Development.

SECTION THROUGH CIVIC CENTER, CALGARY
Showing Bridge Across to Princes Island

THE CIVIC CENTER, CALGARY

THE TENTH ANNUAL CONVENTION OF THE AMERICAN CIVIC ASSOCIATION, WASHINGTON, D. C., DECEMBER 2-4, 1914.

Housing and Town Planning—By far the most important figure at this convention was Mr. Thomas Adams, the foremost town planning expert of England, recently brought to Canada. The Conservation Commission of Canada decided last spring that the greatest work they could do for the country was to conserve humans, and accordingly they have brought Mr. Adams from England to study and suggest the remedy for the housing, sanitation and other town planning problems of the Dominion.

In England, the public could not be aroused to do much about the housing problem until they saw a way out. The garden cities of England, while not by any means a final solution of the housing problem, furnish a social object lesson—a handle by which the public could grasp the possibility of giving every family a comfortable home with plenty of light, air and a garden for a small rental. Town planning, which is merely civic forethought, is now being applied to large areas of all English cities by law, and the slum is being driven out.

Art Commissions in Practice—The other topics of the convention hinged about the various sides of living conditions in our cities. Mr. Andrew Wright Crawford of Philadelphia, showed by most striking lantern slides the designs for public buildings as they were submitted and as the Art Jury of Philadelphia finally succeeded in getting them designed. How can the American people, and we in California, distinguish between the mediocre and the best in architecture, sculpture and painting or in fine landscapes and parks, if we set up no standards for the general public to compare new things with? At present we have no standards. We react to certain designs and forms as occasion or impulse dictates. California can gain much by getting the Legislature to establish a State Art Commission which shall hold up the artistic standard in all public work, and encourage art education and enjoyment for everybody.

Whether the subject was system in city building, beauty or commercial prosperity, bill boards, sky scrapers or parks, nearly every speaker came back to city planning as the only way for our cities to successfully overcome the difficulties with these problems. Constructive planning ahead by a permanent City Planning Commission was the unanimous judgment offered. A great many speakers showed clearly the great economy that such a commission, with sensible exercise and forethought, could effect.

Planning Ahead Pays—In speaking of system in city building, Mr. John Nolen, vice-president of the association, very ably summed up the subject. He said:

"All successful enterprises of magnitude have been planned enterprises; they have not come about by chance. In city planning we recognize that millions of dollars in money and many things more precious than money have been wasted because of lack of plan. Our streets, our parks, our recreation places, our houses and homes, give ample evidence of all this. The first step, it would seem, toward the solution of our social and industrial problems is a comprehensive plan. We need transportation plans to solve our transportation problems; we need a zone plan to district our cities, to give stability to land values and to protect districts; we need an industrial district plan in order to give efficiency to industry, and we need a plan for the homes for the workers, because, without a plan, there is not the slightest prospect that they will be properly housed. Commercial efficiency rests upon rapid and cheap transportation of merchandise, upon the proper location of water and rail terminals and facilities, upon distributing routes and upon contented people in good homes with playgrounds."

* * *

San Francisco Chapter Holds Splendid Banquet

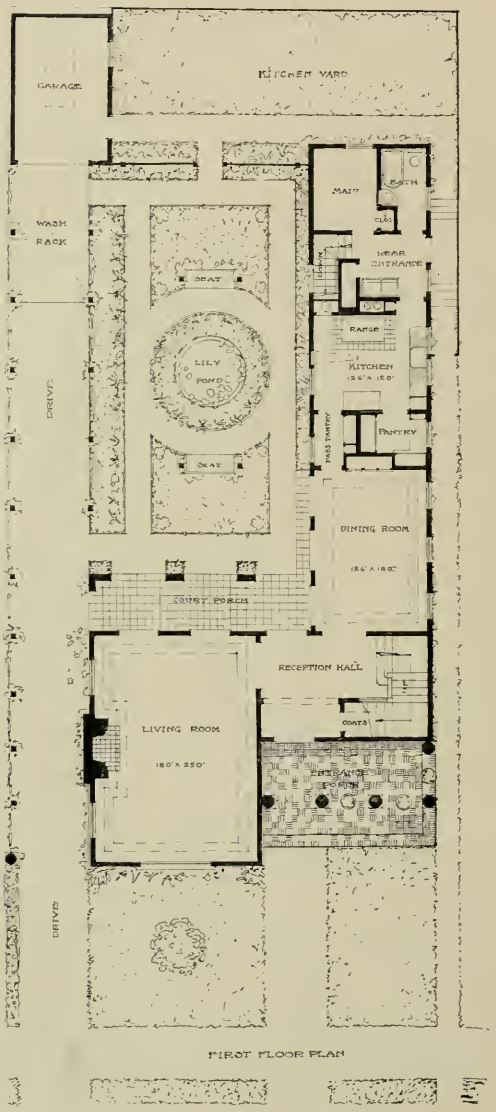
SAN FRANCISCO CHAPTER, A. I. A., had one of the greatest gatherings in its history the other evening. A world of credit must be given President Faville, who arranged the program and invited the guests. The affair was held at one of the leading down-town hotels. Henri Guillaume, the architect sent by the French government to erect the French pavilion at the Panama-Pacific Exposition, was the guest of honor, and more than fifty leading architects of San Francisco were present, together with many members of the profession representing foreign nations. Among these were: J. H. Berner, representing Norway; Francisco Centurion, Cuba; C. J. Oakeshott and J. C. Morrel, Australia; E. Wright, Canada; G. Taheda and B. Ito, Japan. Henry Hornbostle, of New York, was also present.

W. B. Faville, president of the San Francisco Chapter, presided. Willis Polk made the opening address, in which he paid a high tribute to the architectural genius of the French nation, to which, he said, the whole world owed a debt of gratitude.

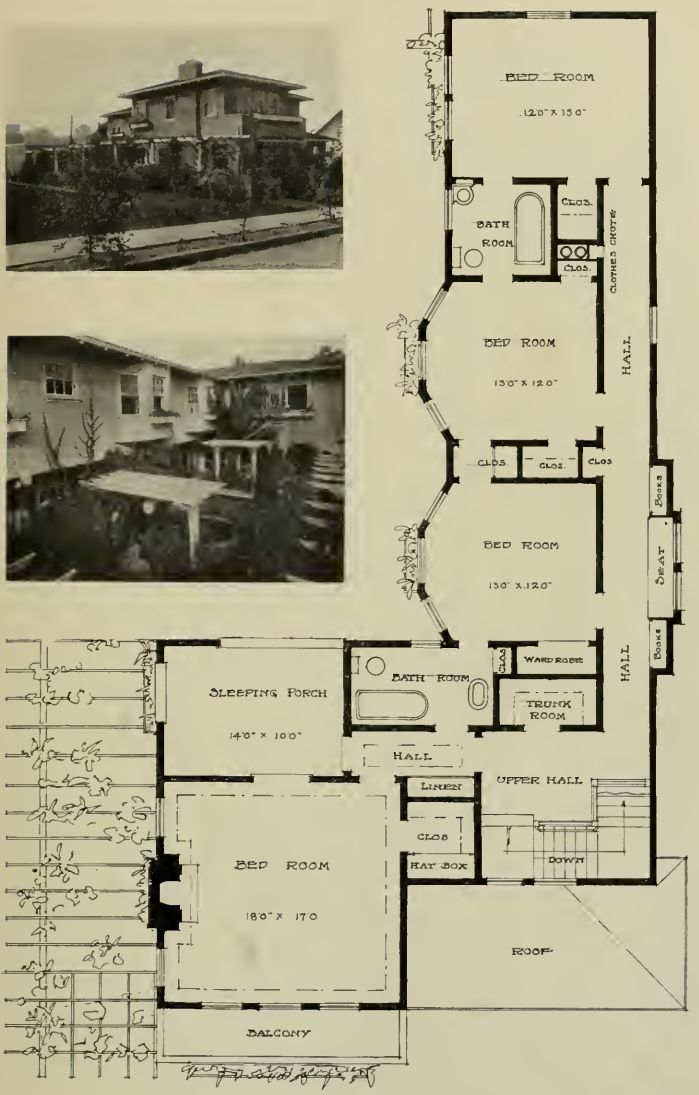
J. C. Morrel of Australia, Henry Hornbostle, John Galen Howard and Arthur Brown, Jr., all paid tributes of appreciation to French architecture and its world-influence.

* * *

Architect H. Ryan, Northern Bank building, Seattle, is preparing plans for the new vaudeville theatre to be erected in San Francisco by Marcus Loew, the New York theatre magnate. Two locations have been under consideration for some time, one being the southeast corner of Market and Fourth streets and the other on the opposite side of Market street, farther west. The theatre will cost $500,000 and will be Class "A."



FIRST FLOOR PLAN, HOUSE OF MRS. JULIA B. GALPIN, BERKELEY SIDNEY B. NEWSOM, ARCHITECT



HOUSE AND YARD AND SECOND FLOOR PLAN
HOME OF MRS. JULIA B. GALPIN, BERKELEY
SIDNEY B. NEWSOM, ARCHITECT

Interesting Experiments With Glue Molds in Reproducing Prehistoric Monuments

By NEIL M. JUDD.*

THIRTEEN visible stone monuments with the ruins of surrounding temples, pyramids, and ceremonial courts are all that remain of a once powerful religious community, near the present station of Quirigua, Guatemala. Sixteen hundred years ago, if we may accept the figures of some students of Central American archeology, this empty city was active with the enthusiasm of its inhabitants; now the calls of jungle fowl echo through the enveloping silence.

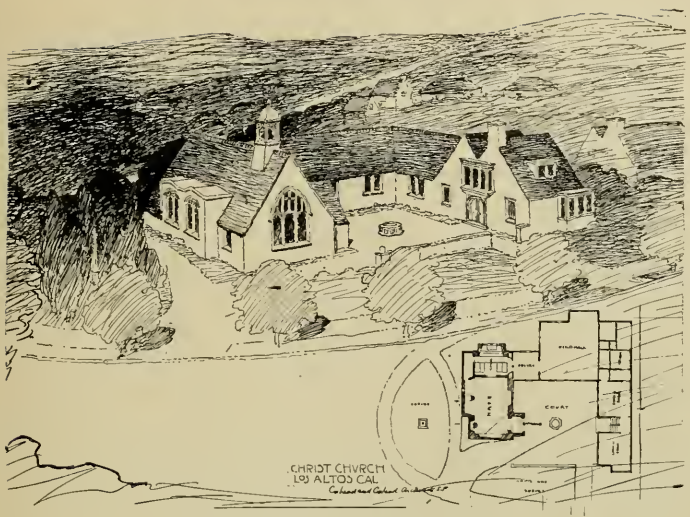
In an effort to preserve this home of a prehistoric people, the United Fruit Company has recently created a reservation of seventy-two acres, thus separating from its enormous banana plantations, a ruin the very existence of which remained unknown until 1840. During that year Mr. John L. Stephens, bearing special messages from the United States Government to that of Guatemala, heard of the old city and sent his companion, Mr. F. Catherwood, to view the site. Mr. Catherwood's sketches, accompanying Mr. Stephens' descriptions, introduced the Quirigua ruins to students of archeology.

Forty-one years later, Mr. A. P. Maudslay, an English traveler, visited the ancient city. He secured hurried notes and photographs, but returned for more detailed observations during each of the two following years and again in 1894. While continuing his investigations of 1883 and 1894, Mr. Maudslay secured paper squeezes and plaster piece-molds of several of the huge carved stones for which Quirigua is so justly famous. Subsequent American expeditions added to Maudslay's list of molds, notes and measurements but a systematic study of the Quirigua ruins had not been attempted, I believe, until Dr. Edgar L. Hewett, Director of the School of American Archaeology, began a series of excavations in January, 1910. With one exception, these excavations have been continued annually since that date and, during the expedition of the past winter, the most recent of the series, I was a chance associate, having in charge that phase of the work which these paragraphs consider.

As a former religious centre of the Maya Indians, the old city of Quirigua consisted of a principal temple area, a large ceremonial court or plaza, and a number of associated temples and pyramids. The dwellings of its devotees were, supposedly, mere palm shelters scattered through the forest-covered valley for some distance beyond the priests' houses.

Mother Nature and all the little elements at her command have been working for generations in their attempt to erase evidence of man's invasion of the Quirigua jungle. Dripping water and swaying branches have cut and grooved the monument surfaces; earthquakes and growing plants have split and broken the heavy stones, thus destroying, to a greater or less extent, the lines and carvings with which they were all decorated. When Maudslay first visited Quirigua, in 1881, the ruins were almost hidden in the dense forest; the sculptured stones were over-grown with a mat of vines and moss in which even large trees had taken root. This growth was removed at that time for photographic purposes but, owing to the tropical environment, the cleaning had to be repeated when the School of American Archaeology began its work and again when the recent expedition commenced operations in January of the present year. The

* Written for this magazine. Mr. Judd is connected with the National Museum, Washington, D. C.



CHRIST CHURCH, LOS ALTOS, CALIFORNIA
Coxhead & Coxhead, Architects

possibility of irreparable damage has rather hastened a realization of the necessity as well as desirability of reproducing these sculptures.

The stone monuments at Quirigua are of two types; tall stelæ or shafts, with human figures carved on both faces and hieroglyphic tables on the shorter sides, and low, zoomorphic stones bearing similar inscriptions along the sides or front of the animal forms. Each stone was originally erected at the end of a Hotun or five-year period and its hieroglyphic inscriptions undoubtedly commemorated the important community events during that interval previous to the one in which the stone was raised. From an archeological point of view, these monuments are valuable not only as examples of prehistoric American sculpture, but also as records whose text may some day be intelligible to us and aid materially in broadening our meagre knowledge of the people who conceived them.

Each monument was cut from a solid block of scoriaceous sandstone, that is, the stone consists mostly of volcanic scoria but also contains quantities of sand and coarse gravel. The action of the elements has loosened many exposed pebbles from their silica cement, thus adding small pittings to the already rough, granular surface and increasing the difficulties of mold-making by resisting all efforts to force an inflexible substance into perfect contact with the surface of the stone and by tenaciously gripping that substance, once it had been properly driven into position. For such a superficial texture, glue proved the ideal agent since the material of the molds was placed in a liquid condition and its natural elasticity, when hardened, permitted great distortion in removal.

Our process of mold-making was very simple. We began by building a light, plaster foundation around the base of the monument. This not

only prevented the escape of the melted glue but also supported the superimposed forms which served as retaining walls for the glue molds. Above the foundation, a given section of the stone was covered with a layer of common clay mud, approximately one inch thick. Over this a carefully-joined plaster form was built, of such dimensions as the breadth of the monument and the depth of its carving required. On the larger stones, the size of the forms was often limited by our ability to handle them—lacking mechanical means of moving heavy masses, we seldom made forms in excess of fifteen square feet.

During the construction of these forms, wooden braces were built into them and anchored with ties of fibre. Such supports increased the strength of the forms and, in addition, their extended ends proved a convenience in handling. Each form was completed, allowed to set, and its edges trimmed before an adjoining form was begun. Upon the completion of the four forms composing each section, all joints were secured with temporary ties of hemp and the working platforms raised for a second series.

In this manner the whole surface of the monument was covered and then, commencing with the topmost form, we began the real process of mold-making. One complete, horizontal section was lowered each day, the subjacent layer of clay thrown aside, and the exposed stone surface thoroughly scrubbed, to remove what mud and lichenous growth still adhered. While the stone was drying, all irregularities on the inside of the four forms were scraped off and the surface painted with a thick coat of clay-water, as an aid in separating form and glue mold.

At the same time, glue tubs were placed over hot-water baths and their contents made ready for the daily pouring. That section of the monument to be reproduced and the inside surfaces of the waiting forms were thoroughly oiled with a composition composed of stearine, kerosine, and vaseline; the forms were raised to their original position and all joints were tied and covered with plaster and hemp. In their "original position," the forms were separated from the monument by an interstice equal to the thickness of the layer of clay over which they had been built. That space which the clay had occupied was later filled with melted glue. The thickness of the resulting glue molds, therefore, depended upon the thickness of the layer of clay they replaced. A section of the plaster form supported the back of each mold the face of which reproduced, in intaglio, the lines and carvings of the monument. From this counter-sunk, glue impression the cast was later taken.

Those receptacles in which the glue was melted were ordinary, galvanized iron wash tubs, secured from the United Fruit Company stores. Two sizes were employed, one containing the glue and a larger one in which the first tub might be placed, the two being separated by three or four small stones and a quantity of boiling water. The outer vessel rested upon metal rods or pointed stones, leaving space for a fire underneath; the water it contained we kept at boiling heat until the glue had thoroughly melted, after which it was ready for the forms.

Pouring the glue was a simple matter and required only a number of pails and men to pass them. Since the normal glue mold shrunk considerably in solidifying, we increased the width of the forms by adding a low rim of plaster to the top of each section and, by filling this enlarged form with glue, secured a slight over-lapping of the glue molds. This enabled us to trim them flush with the original edge of their plaster forms and assured perfect joints when the casts should be finally assembled. Through those forms that inclined from the perpendicular, airholes were

drilled and later closed with clay as the liquid glue, rising in the mold-space, began to flow from them. Improvised funnels were sometimes used in filling the glue-space, the weight of the liquid remaining in the funnel forcing possible air bubbles out of the glue molds and also counter-acting the effect of shrinkage along the upper edge of the mold.

Glue molds must be thoroughly cooled and hardened before plaster casts may be taken from them. To better obtain this condition, our molds were usually poured at sundown and left undisturbed until daylight. Then, as quickly as possible, the forms were lowered and the glue molds prepared for casting. Great care was taken to protect these molds from even the early-morning sun since only a few moments' exposure served to soften and melt-down the impression.

The surfaces of the glue molds were first dusted with French chalk to remove any adhering grease. After this a saturated alum solution was carefully brushed into every pore of the mold surface. On an average, one hour passed before this solution had completely evaporated but it always left a thin coating of alum that hardened the glue surface and protected it materially from the heat generated by the setting of the plaster composing the casts. This alum-hardened surface was painted with a thin stearine-kerosine oil previous to casting.

Our casts were made in the usual manner, that is, the face of each glue mold was covered with liquid plaster and this was added to until a desired thickness had been obtained. During the construction of the casts each was carefully re-enforced with wooden braces and hemp fibre to prevent warping and breaking.

Each horizontal section of the reproductions of the stelæ or upright monuments was composed of four parts, one for each side of the stone. These four parts, with their glue molds and supporting plaster forms, were usually bound together and braced from the inside before being separated from the glue molds. Since all plaster forms were constructed in conformation to the outline of the monument they reproduced, their corner joints were known to be exact, therefore, by carefully joining these forms and, while so joined, uniting the four parts of the cast they supported, the angles of the reproduction became as accurate as those of the original. Any other method would have required numerous measurements and much care in using them. Uniting the casts as we did necessitated, merely, uniform setting of the plaster on the four glue molds and a reasonable amount of speed in joining the casts. Even with our alum solution, the heat of the setting plaster soon melted the glue molds.

Each morning, as soon as the cast had been completed, attention was directed to preparations for the mold that was to follow. The forms were lowered from the next section on the monument and the stone prepared as indicated in preceding paragraphs. The glue molds just used were cut into small pieces and spread for drying; the forms were destroyed and carted into the jungle. It is interesting to note that melted glue, left in pails or tubs, would neither cool nor solidify but deteriorated within a few hours. Also, if the drying fragments of the discarded glue mold were carelessly spread and a free circulation of air prevented, they invariably sweated and soured, rendering them unfit for further use.

Our party entered the field with no experience and but little knowledge of the use of glue molds. During such preliminary experiments as we could conduct while awaiting the arrival of our materials, we learned that, in the tropics, glue or gelatin molds required more careful preparation than in the States. Our first pourings were too thin and resulted in soft, rather

sticky molds. It was soon apparent that a mere dampening of the dry glue flakes gave a thicker, heavier pouring and a more satisfactory mold than was possible with well-soaked gelatin. The impossibility of obtaining cool water for casting also brought its difficulties—speedy work was our only means of overcoming the resulting inconveniences. Another vexing problem was met with in the drying shed where minute worms developed a habit of exploring the interior of our plaster casts. Denatured alcohol, applied to the plaster, seemingly increased their prodigious appetites for they continued to honey-comb the casts unless each reproduction was frequently exposed to the direct rays of the burning sun.

The climate was, of course, the greatest handicap under which the expedition labored. We reached Quirigua at the beginning of the dry season, a ninety-day period during which the rains are more irregular and of shorter duration than usual. Temperatures were distinctly tropical, a fact that only increased our troubles. Under such conditions, not only the nature of our medium but personal comfort as well required a temporary shelter over the monument being cast. Accordingly, canvas tarpaulins were drawn over poles that reached above the stones, drop curtains being utilized when driving rain-storms or the afternoon sun threatened the exposed parts of the monument.

During February, March and April, the three months during which records are available, the average daily temperature, as observed on the shaded veranda of the nearest United Fruit Co. farmhouse, was 66° at 6 a. m.; 88° at 12 noon; and 76° at 6 p. m. In the small, open space where our work of reproduction was pursued, the temperature was obviously higher and more unbearable. The direct rays of the sun were unmerciful and the 150 foot wall of surrounding jungle successfully turned what occasional breezes would otherwise have freshened the plaza. A persistent, high humidity, added to this heat, was certainly a sufficient test as to the practicability of glue molds in the torrid zone.

For shipment, all casts were packed in wooden crates and protected by dried banana leaves. The fact that they survived the rough handling of Central American ports and reached New Orleans with very little breakage was owing to careful and generous re-enforcement of the casts rather than abundant packing.

Our work was continued over a period of four months, during which time casts were made of six colossal monuments. Each of these reproductions is an exact duplicate of its original and exhibits not only every line and carving of the primitive sculpture but the very texture of the stone itself. Compared with the results obtained by other processes, the casts from our glue molds are so vastly superior as to beggar description. The completed reproductions are now on exhibition at the Panama-California Exposition, San Diego. Later they will be removed to the halls of the School of American Archaeology at Santa Fe, New Mexico.

* * *

The Bricklayer Again

A bricklayer lay ill, and the doctor having done what he could, told the man's wife to take his temperature in the morning. Calling the next day, the doctor asked if his instructions had been followed.

"Well, we didn't have a 'tremometer' in the house," the good woman replied, "but I put a barometer on his chest and it went up to very dry. So I gave him a bottle of beer and he's gone to work."—Chicago Herald.

The Architect's Wife: A Study of Difficulties

(From the London Builder)

THERE are few more difficult roles to play in the drama of life than that of an architect's wife, for she must be gifted by nature with a dual personality, or else be a consummate actress and one who can instantaneously play a part when necessity demands. Being a woman, she knows that no man can design a house without making grave mistakes, for is not a woman's intuition of more value than any man's knowledge where the details of a house are concerned? On the other hand, has she not promised to love, honor and —— her husband—that is, a man whose judgment she knows is at fault in matters which only a woman can speak authoritatively about? The result is that there are two warring elements at work, neither of which can be consistently satisfied.

If, as is sometimes the case, her husband's clients are her personal friends, she is in a quandary, for she sees the defects of his work, but must in loyalty to him conceal her knowledge till she can have a tete-a-tete with him. Her eloquence is checked because she cannot give free play to her understanding; she is, in fact, in the position of counsel defending a criminal of whose guilt he is assured, and, being a woman, her sense of justice is not satisfied with the consolation that she is but following time-honored precedent, which is sufficient for a mere man and husband. The difficulties of an architect in his attempt to secure his ends by the means of a number of imperfect agencies such as the work of builders and workmen do not as a rule appeal to a temperament which is idealistic and thorough to an extent that man seldom understands. Ultimate perfection seems to her attainable, and any defects which occur through defective oversight or want of judgment are dismissed as things which should have been obviated. No woman really thinks that to err is human, and, though in large matters her forgiveness may be divine, she is often unwilling to exercise it in the trivial affairs of life, perhaps thinking by so doing she is throwing pearls before swine. Every woman for whom an architect builds finds defects in the house which has been completed, and the architect's wife finds her natural sympathy with her own sex and her womanly esprit de corps in conflict with her position as the wife of the offender. If the architect's work is of a public character his difficulty largely disappears, for his wife will admit that he is more likely to know the requirements of a public building than she is; nor will she be placed in the same personal contact with the employers, as is often the case with a house.

Is there any way to avoid the grave dilemmas which we have indicated and to save the architect's wife from the difficulties which we have briefly described? The most ideal plan is, as it usually is in life, the least practicable one—that the architect should keep his profession a secret from his wife. If he could get through life described as being "something in the City" the difficulty would vanish, but in most cases this would be impracticable, and the architect has to stand in the dock from the outset. Or if, on the other hand, all his work lies at a distance from his dwelling place, and his clients are unknown to his wife, he will be able to conceal his defects from sight; but this, again, is not always practicable. In the third case, he may try to obtain some of the advantages of collective action by securing his wife's criticism of and acquiescence in his designs before they are executed; but this method has the disadvantage that the architect's wife is burdened with the responsibilities of her husband's business as well as her own affairs.

We have but shortly explained some of the difficulties of a position which we have often felt sympathy with, and there seem to be only two solutions, namely, that if a man elect to follow architecture as a calling he should not marry, or, if he looks forward to marriage, he should not elect to be an architect, as if he does both he places the lady of his choice in a position the difficulties of which are exceptional. But women are nothing if not self-sacrificing and heroic, and, difficult as the position is, many acquit themselves as only women can, and it certainly is true that no woman is so worthy of canonization as she who adequately fills the difficult role of the architect's wife, for she can be classed with the camel who passes through the eye of a needle or the Chancellor of the Exchequer who produces a Budget which pleases every class of the community, convincing them that it is more blessed to give than to receive.

* * *

Height Limit of Concrete Buildings

A WRITER in St. Nicholas, a famous old juvenile monthly, recently used some interesting illustrations in telling young America about the possibilities of reinforced concrete as applied to skyscrapers. His story is as follows:

"Aren't you ever going to reach the height limit of these tall buildings? asked one of the boys. I should think they would soon be too heavy for their foundations."

"Not at all; not at all," said Mr. Hotchkiss, looking around for an illustration. Then he fumbled in his pockets and pulled out a small bolt. Unscrewing the nut, he measured it, and found that it was a scant inch square.

Then he placed the nut on the ground and stood on it. "There, now I am subjecting the ground to a greater strain than is this whole building."

We looked at him incredulously. "Yes, I weigh 210 pounds. Two hundred and ten pounds on one square inch makes how much per square foot? Reckon it up."

Fifteen tons per square foot was the outcome of the figuring.

"That's it. The building regulations of this city do not allow a weight of more than fifteen tons per square foot on the foundations. A foolish regulation, in my estimation, because of the idea that concrete would crush under a heavier load than that; but the kind of concrete we have nowadays, thoroughly reinforced with steel, will stand a far greater pressure. You can see for yourselves how ridiculously light the load is when you figure it down to square inches. Why, many a fat woman who picks her way across a muddy street on her French heels, exceeds the limit of the building code for pressure on the earth."

"But I can't believe," protested one of the boys, "that a big building like this puts a strain of only 210 pounds on the ground. Do you mean to say that if you cut a sliver out of this wall from top to bottom and only an inch thick by one inch wide it would not weigh more than 210 pounds?"

"Well, not exactly that. If your sliver were cut out of one of the steel columns, it would weigh six or seven times as much as that, and if it were cut out of the elevator shaft, it would be as light as air. You must remember that very little of this building is solid all the way up. At the bottom of the columns there is a footpiece that spreads the weight over a large area of concrete. There are 69 concrete piers under this building. It is a regular centipede, with concrete legs all over that stand on rock 120 feet below the sidewalk. Some of those legs are twenty feet in diameter. You will find that there are quite a few square inches in the foundation supports of this building.

"Altogether the finished structure is going to weigh something like 100,000 tons, with an allowance of 20,000 more for wind-pressure. This isn't very much when you consider the size of the building. If you could throw the finished building into the ocean, it would float, provided the doors and windows did not leak, and what is more, fully five-sixths of the building would project out of the water.

"Oh, we haven't reached the height limit by any means. Somebody has figured out just how tall a building could be erected on a point 200 feet square without violating the building code. He estimated that the building would be 150 stories high, reaching 2,000 feet in the air; and it would weigh 516,500 tons. It could cost $60,000,000, and it would be required to stand a wind pressure of 6,000 tons. As a matter of fact, it would take something like 50,000 tons of wind pressure to upset the structure.

"Of course, a building like this would not stand on concrete legs, but would have a single solid foundation pier 200 feet square, running down to bed-rock. If the steel work could be erected directly on the rock without any concrete between, no doubt permission could be obtained to add a few more stories on top."

* * *

Prospects for Contractors

WHENEVER normal conditions are upset by a disturbance of some kind resulting in financial and business depression, contractors are among the first to suffer and, very likely, among the last to feel the effects of the recovery.

It is at such times that contractors must depend on municipal improvements for work to keep them busy.

Immediately upon the assumption of hostilities in Europe, business and commitments were curtailed to an unusual extent and new contract work which for several months previously had been very dull, was further restricted. Therefore contractors were feeling particularly discouraged.

This being the outlook, an investigation made by Engineering and Contracting should be especially encouraging to contractors. That publication inquired from a number of city officials as to the prospects for municipal improvements in the year to come. From one hundred and fifty cities whose mayors answered the inquiry relative to possible curtailment of city improvements, the following results were reported:

3% are expecting that construction work will be decreased, but solely because of local conditions.
19% are having or expect to have difficulty in disposing of improvement bonds.
63% think that European conditions will have no effect upon municipal work.
5% have already financed all work proposed for the coming year.
10% expect to do even more work than usual.

Taken only at their face value these figures are highly encouraging. We believe that a premium may safely be placed on their face value.

There are very good reasons why the average city should put forth extra efforts at this time to finance the construction of public works. The reasons are:

1. Favorable market for city bonds.
2. Competition among the best class of contractors.
3. Cheaper materials.

As regards the sale of city bonds, investors always turn to them as one of the safest forms of investment whenever business is upset, and they are doing so much more now that the stock exchanges of the world are closed. The stimulation in investments during October and November will be even more

pronounced because of those conditions, and municipalities should take full advantage of the time before the usual December interruption.

There is a financial stringency in business because banks have generally restricted credits, but this stringency does not affect the investing public very materially. The eagerness with which people have subscribed for the recent issue of the New York City bonds, and similar issues in a score of other cities indicates clearly that there is a good market for this class of securities.

The best and cheapest work is obtained when it results from keen competition among the best class of contractors. Never before have we seen so many of the best firms in the country compete for public construction work which, heretofore, was quite outside of their line of work. As an instance of this may be recorded the three million dollar sewer contract recently awarded by the City of St. Louis to one of the largest railroad contractors in the country. Owing to their superior resources firms of this kind are able to undertake very large municipal contracts, and since much of the work is sub-let the smaller contractors also benefit.

By taking advantage of this favorable combination of conditions, municipalities will not only get their work done better and for less money than otherwise, but they will also help immensely to restore individual confidence because of their unabated vigor in prosecuting their normal activities.

In this connection, the newspapers have a duty to fulfill. In the rush to publish more or less authentic war news, their columns have been so filled therewith that domestic matters of greater relative importance have received scant or no consideration.

* * *

Panama-Pacific Exposition Notes

A panoramic reproduction of the Grand Canyon of Arizona has been built at a cost of over $300,000; over fifty thousand square yards of linen canvas, imported from Scotland, were being used for set pieces. Visitors in this concession will view the panoramas from observation parlor cars, moved by electricity on an elevated trestle, seemingly along the rim of the canyon.

* * * *

So comprehensive is the display of paintings and statuary embraced in the international loan collection at the Exposition that many annual art exhibits are to give way to the exposition. The Carnegie Institute of Pittsburg has notified the exposition that it will not hold a 1915 exhibit and this will be the first time in eighteen years that there has been no annual display.

* * * *

One of the features of the Washington building at the Panama-Pacific International Exposition is Ezra Meeker and his team of oxen. Meeker, white of hair and beard, drove his team from the State of Washington to the exposition. A few years ago he drove them over the trail from Seattle to Washington, D. C.

* * * *

Henry Ford, automobile manufacturer, shows in the Palace of Education and Social Economy of the Panama-Pacific International Exposition the detailed workings of the social service innovation made in his factories. The details of his division of 3,000 acres into 15-acre tracts for workers also are shown.

* * * *

All but one of the great main exhibit palaces were completed five months before the exposition opening day—February 20, 1915.

For the first time in the history of China that nation will have machinery exhibits at a world exposition. China has 2,000 square feet in the Palace of Machinery, the largest of the exposition structures.

* * * *

The tallest flagpole ever erected, a 232-foot stick of Oregon pine, stands in front of the Oregon building. The flag pole was contributed by the citizens of Astoria, Oregon.

* * * *

Six hundred square feet of exhibit space have been alloted to Christian Science in the Palace of Education and Social Economy at the Panama-Pacific International Exposition. The exhibit includes a display of the many Christian Science publications.

* * * *

One of the strangest sights in the world is to be seen in the "Yellowstone Park," a great concession on "The Zone" at the Panama-Pacific International Exposition. The concession covers more than four acres and is surrounded by cliffs rising more than 100 feet, the whole being painted to nature's colors and covered with shrubs, plants and moss to complete the illusion of naturalness. An exact duplication of Old Faithful Inn stands at one side of the concession, while in its center is the largest topographical map ever made, reproducing every feature of the Yellowstone Park and 220 feet across. Geysers, a waterfall 85 feet in height, and many superb spectacles are features of the display.

* * *

Paint Protects Property

Many a man is punctual about protecting his property from loss by fire, but fails to protect it against the weather, such as the sun, the wind and moisture. He can appreciate the destruction which comes from fire, but he is totally blind to the slower destruction which takes place day by day and month by month, from climatic conditions.

The loss by fire is a possibility of, say one in a thousand, but he protects himself against this. The certainty of deterioration from rot and rust, shrinkage and warping is ever present and can only be guarded against by being properly painted.

In placing fire insurance the premium paid is absolutely gone and the owner has only the sense of protection. By properly caring for his property in other ways, however, such as painting, repairs, etc., he sees the worth of his money in the improved appearance of the building, the certainty that it will last longer and give him the satisfaction of the better building. Fire insurance is merely insurance against sudden loss, while paint and repair insurance prevents the loss in the first place and increases the market value at the same time.

The cost of painting and keeping up the appearances and good condition of the building may run a trifle more than the fire insurance, but it is money well spent.

One well-known Western Canada firm issues an advertisement regarding paint increasing the value of property, in a very forcible manner by showing an unpainted building, looking in a very dilapidated condition, its market value being about $3,000. After receiving a coat of paint the same property looks transformed by its beautiful appearance, and now would easily bring an additional $1,000 to its owner, while at the same time ensuring him a building which would outlive the weather conditions by many more years than would the unpainted building.

BERTHOLD MONUMENT, MONTEREY, CALIFORNIA
Willis Polk & Co., Designers

The Berthold Monument and Pool at Monterey, California

THIS beautiful monolith was designed by Willis Polk and Company, the San Francisco architects, and was constructed by the Schoenfeld Marble Company, under direction of the well-known artist, Francis McComas. Built of Indiana limestone, it stands in front of the first city hall in California, a building still in use, a monument to the public spiritedness of a humble townsman, George Berthold, who died in comfortable circumstances and bequeathed sufficient funds to build this notable structure. Daniel O'Connor's beautiful verses, which are graven on the stone, are here reproduced:

MONTEREY

In the mantle of old tradition,
In the rime of a vanished day
The shrouded and silent city
Sits by her crescent bay.

The ruined fort on the hill-top,
Where never a bunting streams,
Looks down on cannonless fortress,
On the solemn city of dreams.

Gardens and wonderful roses
Climbing o'er roof and wall;
Woodbine and crimson geraniums,
Hollyhocks, purple and tall.

Mingle their odorless breathings
With the crisp, salt breezes from the sands
Where pebbles and sounding sea shells
Are gathered by children's hands.

Women with olive faces
And the liquid southern eye,
Dark as the forest berries
That grace the woods in July,

Tenderly train the roses,
Gathering here and there
A bud—the richest and rarest—
For a place in their long, dark hair.

Feeble and garrulous old men
Tell, in the Spanish tongue,
Of the good, grand times at the Mission,
And the hymns that the Fathers sung.

Of the oil and the wine and the plenty,
And the dance in the twilight gray—
"Ah! these," and the head shakes sadly,
"Were good times in Monterey."

Behind in the march of cities,
The last in the eager stride
Of villages born the latest,
She dreams by the ocean side.

DANIEL O'CONNOR.

* * *

Exposition to Honor Architects

For the purpose of affording the exposition directorate an opportunity to express its appreciation to the men who designed and executed the exposition, arrangements are being made to hold a special day in their honor. The department of special events has the programme under way, but as yet nothing definite is ready for announcement either as to the date or the events on that day. It is planned to honor both the architects, artists and others who have had a part in designing the exposition.

* * *

Opportunity to Study Architecture

The Department of Architecture of the University of California announces that a class in drafting has been opened in the Underwood building, San Francisco, for the convenience of those wishing instruction in architecture and who cannot take up the regular course at the University. A similar class is also planned for Oakland.

* * *

Lincoln Beachey, the well-known aviator, is to build a home in Forest Hill, San Francisco, to cost $8 500. The architects are Larsen & Coleman.—Architect & Engineer.

Here's hoping the aviator owner won't have the architects "up in the air" before the job's completed.—Improvement Bulletin.

THE
Architect and Engineer
OF CALIFORNIA

Published Monthly in the interests of the Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast by the Architect and Engineer Co.

BUSINESS OFFICE AND EDITORIAL ROOMS
617-619 Monadnock Building, San Francisco
Telephone Douglas 1828

TERMS OF SUBSCRIPTION
(Including postage) to all parts of the United States $1.50 per annum; to Canada 50c additional; to all Foreign points $1 additional.

Vol. XL. February, 1915 No. 2

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THE TIME TO BUILD

This is the time to build. Depressions that have prevailed for the past six months have brought building conditions to a state most favorable to the investor. Probably there will not again occur such opportunities in the active years of men now living. Just get busy as quick as you can so as to make the most of the situation. Nothing is more certain than that the recent business and industrial lethargy will be followed by a great rush of enterprise and progress. Those who begin early get the picking of the ripest grapes.

LICENSING ENGINEERS AS WELL AS ARCHITECTS

There appears to be a well directed movement looking to the licensing of engineers by State authorization, along some such lines now prevailing in California and other States for licensing architects.

In Pennsylvania a commission has been appointed by the Governor, and in New York enactments looking to the licensing of engineers have been drafted and introduced in the Legislature.

Those who are opposed to the registration of engineers hold that by such means the public would secure no additional protection against the professionally inefficient. They cite the legal and medical professions as providing thousands of "fakes" who manage to pass the required test.

Personally, we hold some sympathy with this view, for we are thoroughly persuaded that in general the civil engineer is a more wholesome man—and a better man professionally, physically and morally—than either the lawyer or the doctor. But the fact remains that the legal and medical professions enjoy a higher professional status. Why is this? Does not registration provide at least a part of the reason?

It is adduced in all seriousness that one of the most aggravating difficulties in the way of enforcing a licensing bill is to determine the

character of the examination. Concerning such examination, the Engineering Record says in a recent editorial:

It must necessarily be sufficiently elementary to allow comparative newcomers in the profession to pass, yet such an examination is not a criterion as to the ability of a man to design a large structure, in which the hazard to life and property is much greater than any work that would be entrusted to a man who could barely pass the stated examination.

One might advance the same argument in regard to surgery. A "comparative newcomer" might know how to perform such a "simple" operation as lopping off a limb. Such knowledge might go a considerable way in passing him into his profession. And why not? The rest will depend upon the experience and reputation that he may bring to bear later. Only if he acquires name and fame will he be entrusted with those intricate, delicate touches of the surgeon's knife which hold the secrets of life and death. It is not to say that because he never attains to the highest proficiency in his profession that he is unqualified to render excellent service in it.

Is it not reasonable to apply the essence of this argument to engineering? Is it possible that the requirements would have to be so elementary that they would not act as an effective bar to admitting to the profession men incapable of observing those fundamentals of their work which, after all, reduce to a minimum the "hazard of life and property?"

A Criticism of the "Modern Style of Architecture."

N. Serracino, a New York architect, with offices in the Johnston building in that city, has recently returned from a five months' trip through England, France, Switzerland and Italy, during which period he made exhaustive studies, from an architect's point of view, of the public buildings in the leading cities of those countries. It is gratifying to note that Mr. Serracino considers America far in advance of Europe with reference to heating, ventilation and sanitary requirements.

Mr. Serracino has lived in New York City for the past eleven years, being a graduate of the Royal University of Naples. In 1911 his drawings of the Eglise St. Jean Baptiste were exhibited at the International Exhibition held in Turin, earning for him a gold medal. This church, recently erected on the southeast corner of Lexington avenue and 76th street, New York City, when completed will have cost nearly a half million of dollars.

Mr. Serracino's observations and conclusions are in part as follows:

When I left New York for Liverpool and London I anticipated that the buildings in these cities would be of Gothic design, but found that, with the exception of the Houses of Parliament in London, all the public edifices were in the Greek and Roman style.

When I got into France, Switzerland and Italy I noticed that most of the buildings in course of erection were designed after what is coming to be called the Modern style. Hotels, residences, theaters; in fact, all kinds of buildings, even chapels and mausoleums, are so built. Some architects call it the Floral, others the Liberty and still others the Art Nouveau style. These names, in my opinion, are not exactly correct. I think it might more legitimately be termed the Modern style.

This Modern style varies from all others in that it is unhampered by the rules, traditions and proportions of the classic orders. The art of decoration is based more on imitation of natural flowers and plants, transforming them to suit decorative purposes. In France, Switzerland and Italy it seems that this Modern style is being generally used and it appears that a large part of the public is beginning to like it. This Modern architectural decoration is inspired by simplicity, limiting the ornamentation and is free from all tradition and the rules of everthing that was done before. Flowers and plants are imitated and in some buildings policrome effects are produced.

While these are the ideas of the Modern style, we highly condemn the so-called futurists, who in art are like anarchists, in that they would destroy the artistic heritage of the past and attempt to create something entirely new, which would be a difficult task for the greatest of architects.

This Modern style is highly commendable in some instances, but it is being used to excess and a great many architects are employing for ornamentation flowers and plants which have been transformed to such an extent that in many cases the style has been made to appear ridiculous. Eccentricity has been given too much latitude.

Most of the buildings in Europe are now being built with reinforced concrete, using stucco on the outside with different finishes. Even natural stones are imitated in a surprising manner by using the cement and finishing the surface with powder of the real stone they are imitating. There are many fine examples of this in Switzerland and in Northern Italy.

I have seen beautiful examples of the Modern style in residences and theaters and liked them very much. I have seen other buildings where there was too much ornamentation and eccentricity, and in such cases this Modern style did not appeal to me at all.

I should not like to see this style employed for public buildings, or for that matter, buildings of any serious nature. In Rome I noticed several examples of this architecture and I wish to criticise strongly the extension to the Montecitorio building now being used as the House of Parliament. This old building was begun by the great architect, Lorenzo Bernini, in 1650 and completed by C. Fontana. It is a beautiful specimen of the good period of the Borocco style. The new extension, however, is being erected in the Modern style, flowers, fruits, and plants being used for ornamentation. The new addition as it is being built, would look very well if it were going to be used as an apartment house or hotel, but it is by no means suitable for a House of Parliament, particularly as an extension to the work of Bernini, who was an architectural genius. In my opinion it should have been compulsory that the same style be employed for any addition to such a building. The Bernini facade will be left unal-

With the Architects and Engineers

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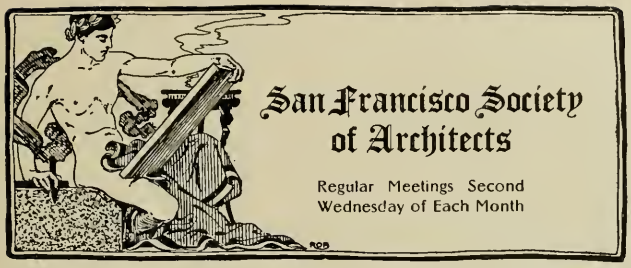
tered, but the rear and a portion of the side elevations will be in the Modern style.

While in Rome, I visited the American Academy of Fine Arts, which is situated on the Janiculum Hill, one of the beautiful spots of Rome. The director, Mr. Jesse Benedict Carter, kindly showed me the old and new buildings and also took me through the gardens. The new building is beautiful and simple in design; the outside is dignified and correct and the inside very comfortable and sanitary.

Another thing to which my attention was called was that while all the important buildings in Europe, old and new, are carefully decorated on the outside and inside, it appears that to a greater or less degree the heating and ventilating systems and the sanitary requirements are deficient. In this respect America is far in advance of any of the cities I visited in Europe.



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January Meeting of San Francisco Society of Architects

The regular monthly meeting of the San Francisco Society of Architects was held at the University Club, California and Powell streets, on the evening of January 13th, 1915.

A short time was devoted to the discussion of the "Development of the Foot of Market Street" and it was decided to make this the subject of deliberation at the next meeting at which Mr. O'Shaughnessy, the City Engineer, has accepted an invitation to be present and assist in the discussion.

Mr. Mullgardt read a report submitted to the Governor by the Advisory Committee which was appointed by the last Legislature to prepare a bill creating a State Art Commission. The bill has been introduced by Senator E. S. Birdsall and has been referred to the Finance Committee of the Senate, of which Senator Strobridge is chairman. It is hoped that the members of the Society and all those interested in the Fine Arts will use their influence to bring about the enactment of this bill.

The guest of the evening, Monsieur Henri Guillaume, the architect representing the French government in the construction of the French building at the Exposition, made a few remarks.

$20,000 Residence

Architects Garden & Kuhn, have moved from the fifth to the eleventh floor of the Phelan Building, San Francisco. Plans are being prepared by this firm for a handsome $20,000 residence to be erected in Oakland.

Competition for Hospital Wing

A competition for the selection of an architect to prepare plans for the southeast wing of the San Francisco Hospital has been ordered by the Board of Works on the recommendation of the city's consulting architects, John Galen Howard, Frederick H. Meyer and John Reid, Jr., who have laid out the programme of the competition.

The cost of the building is estimated at $400,000, and the architect's fee will be $24,000. For the expense of the jury by whom the prize design will be chosen, $3000 will be set aside. The Board of Works will appoint two of the jurors, one of whom is to be an architect, not residing in California, and the other a physician or other hospital expert. These two will choose the third juror. The award is to be made by April 15th.

The competition has been limited by the consulting architects to the following: Bakewell & Browne, Herman Barth, John Baur, L. B. Dutton, W. C. Hays, August Headman, L. P. Hobart, G. W. Kelham, Krafft & Sons, H. H. Meyers, B. R. Maybeck, L. C. Mullgardt, William Newman, Perseo Righetti, Houghton Sawyer, Ward & Blohme and C. P. Weeks.

Citrus Experiment Station

Architect Lester H. Hibbard, 722 Marsh-Strong Building, Los Angeles, has been commissioned to prepare plans for the new citrus experiment station to be erected at Riverside for the University of California on the site recently selected by the Board of Regents. About $125,000 will be expended upon the buildings.

Honor for New Orleans Architects

The architecture and building fraternity has been given liberal representation on the Board of Directors of the New Orleans Association of Commerce, a commercial organization that is developing a new economic era in New Orleans and Louisiana. Two of the leading architects of that city, Allison Owen of Diboll & Owen, and Charles A. Favrot of Favrot & Livaudais, were recently elected members of the Board of Directors of the New Orleans organization, and Ernest Lee Jahncke of the Jahncke Navigation Company, building materials, has been elected vice-president.

To Repeal Obnoxious Law

State Senator Herbert C. Jones of San Jose is the author of a bill now before the California Legislators, repealing the old law of 1872, which, under recent decisions, has been interpreted as requiring all plans in competition to be submitted in detail and also prohibiting public boards from selecting plans except by competition.

By the abolition of this act, public boards will have the same freedom of choice that individuals now have and architects will be able to use as preliminaries, ordinary sketch plans, instead of plans in detail.

Nice Commission for Mr. Meyer

Architect Frederick H. Meyer, Bankers Investment Building, San Francisco, has been commissioned to prepare plans for extensive improvements to the Calistoga Hot Springs property, near Napa, California, owned by Dr. Elmer E. Stone, 291 Geary Street, San Francisco. The work to be done includes the erection of a large sanitarium or hotel, 30 or 40 cottages, two bath houses, dancing pavilion, garage, etc. The two bath houses will be built first, one for mud baths and the other for sulphur baths. All the buildings will be of frame construction.

Ambulance Construction Commission

This is the first great war in which field motor-ambulances have been extensively used. It was inevitable that many defects should be found in existing types, and in various quarters experts began to ask whether something could not be done to standardize the patterns and to improve the type. At the instance of Mr. Henry S. Wellcome, the founder of the Wellcome Bureau of Scientific Research, a commission has been formed, and the names of members show at once that the matter is regarded as of first importance by those most intimately connected with the welfare of the wounded soldier.

This commission will first and foremost act as a judging committee for the award of prizes of the value of £2000 provided by the Wellcome Bureau of Scientific Research. These prizes are offered for the best designs of an ambulance-body which shall fit a standard pattern motor-chassis for field motor-ambulances. The last day for the receipt of competing designs is June 30, 1915. It is hoped that the competition will bring in a number of ingenious designs, from which the ideal field ambulance-body will be evolved.

Plans Approved for Masonic Temple

Architect A. D. Fellows, of Auburn, Placer County, has completed plans and same have been approved for a two-story Class "C" store and lodge building, to be erected in Auburn, for the Masonic Hall Association of that city. The enterprise has already been fully financed and will cost approximately $40,000. The building will be of steel and concrete and will have a total frontage of 100 feet with a depth of 80 feet. There will be stores on the ground floor and hall on the second floor. H. M. Cooper is president of the Building Association.

New Home for Federal Bank

It is reported on good authority that the United States Federal Reserve Bank which is now occupying temporary quarters in the rear of the Merchants National Bank Building, at Market and New Montgomery Streets, San Francisco, is negotiating for a building of its own. Several architects' names are mentioned in connection with the proposed new building, among them Edward T. Foulkes, and D. C. Coleman. It is said that the bank is desirous of having a Market street frontage.

Architects Granted Certificates

The State Board of Architecture for Southern California has issued certificates to practice architecture to the following:

Francis A. Brown, 239 N. Wilton Place; Carl Reger, 532 Laughlin building; George M. Lindsay, 453 Holland avenue; Walter S. Davis, 621 Exchange building, and H. Scott Gerity, 620 Exchange building, all of Los Angeles, and Robert R. Curtis, 1435 Grove street, San Diego.

Death Calls John Baur, Sr.

John Baur, Sr., father of John Baur, Jr., a well known San Francisco architect, died at the Lane Hospital in San Francisco Sunday evening, January 24.

Mr. Baur came to California in 1862, via the Isthmus of Panama. He lived for a number of years in San Luis Obispo county, and later conducted a jewelry store in Petaluma. Six years ago he moved to Napa.

A Good Omen for San Francisco

A local news item states that workmen excavating for a new building on Nob Hill, San Francisco, uncovered some boulders of gold-bearing quartz on the exact spot where originally stood the beautiful pilaster, now erected at the edge of the lake in Golden Gate Park, and familiarly known as the "Portals of the Past."

San Francisco's wealth was derived from gold and silver mining. The Mother Lode country, the small persistent veins of Nevada county, the old-time placer work, and the great Comstock lode of Nevada provided the basis of San Francisco's wealth. It is still an important mining center, but as the founders of her great mining fortunes have reached the fullness of their lives and have passed to the Great Beyond, their descendants have become interested in other business and her present prestige as a mining city is not comparable to her traditions. Especially were the wealthy and hospitable residents of Nob Hill indebted to mining for the great fortunes which enabled them to give their city the reputation of being "loved around the world." "Portals of the Past" was built by money derived from mining; is it, then, not an omen that gold ore should be found today almost beneath the original site of these portals? An omen pointing the way to even greater wealth and prosperity!

Government Forts to Have Architecture

In the construction of Fort McArthur on the government's reservation of one hundred and one acres near San Pedro, the board of engineers appointed to decide upon the location, lay-out and construction of the various buildings will endeavor to have adopted some type of architecture in keeping with the natural surroundings and an adaptation of the Mission style may be chosen as conforming with the traditions of Southern California, according to Maj. R. R. Raymond, resident government engineer and a member of the board. The board expresses the desire to make Fort McArthur a beauty spot, attractive not only to tourists but to residents of this locality.

"In the past," says Major Raymond, "the War Department has been in the habit of building its forts along a certain plan of architecture. Whether the fort be erected in Alaska or at some beautiful point along the coast made no difference, and the rough, though substantial, buildings were put up. We will try to have this rule set aside when the construction of Fort McArthur is begun."

The fort will be open to visitors after completion and will undoubtedly attract large numbers of sightseers.

Carpenters Don't Like Rain

Considerable interest has been taken in the newspaper accounts of the passage of a resolution by the district council of the Bay Counties Carpenters' Union protesting against working in the rain on the Panama-Pacific Exposition buildings. One contractor is said to have supplied over 700 carpenters in his employ with raincoats, also hot coffee, the latter at frequent intervals, so as to complete the buildings at the earliest possible moment. The resolutions passed by the carpenters' district council are reported to be as follows:

That no carpenter employed on the Panama-Pacific Exposition shall be compelled to work in the rain by any contractor.

That no carpenter shall be discharged for refusing to work in the rain.

That no carpenter shall be compelled to buy a raincoat in order that he may work in the rain.

That no carpenter who does not own a raincoat shall be compelled to put up a deposit for the use of a raincoat furnished by the contractor.

$200,000 Warehouse

Plans are well along in the office of Architect Leo J. I. Devlin of San Francisco for a large four-story warehouse of mill construction type to be erected on Kansas street for John Rapp, at a probable cost of $200,000. The entire building has been leased by Dunham, Hayden & Kerrigan, the well-known supply house. Automatic sprinklers and steel rolling doors and windows will be used.

San Francisco Man to Build Hotel

Architect R. C. Ferguson of Los Angeles has prepared sketches for a hotel building to be built at Honolulu for H. F. Lewis of San Francisco. The old Claus Spreckels residence which is on the grounds, will be remodeled and made a part of the hotel. The construction will probably be hollow tile and will cost about $100,000.

Contract for Big Apartment House

Architect Houghton Sawyer, Shreve Building, San Francisco, has let a contract to Williams Bros. and Henderson for the carpentry and mill work on the new Stanley Morsehead Apartment House, at California and Powell streets, San Francisco. A contract for the wiring on the same building has been let to the General Construction Company.

Reinforced Concrete Warehouse

Architect W. J. Dodd, Marsh-Strong Building, Los Angeles, has plans for a four story reinforced concrete warehouse to be erected on Bay street for the H. R. Boynton Company, dealer in plumbing supplies. The engineering work will be done by H. E. Bean, 717 Central building. Building will cost about $100,000.

Buildings Erected in San Francisco in 1913-1914

The San Francisco office of the United States Steel Products Company has compiled the following interesting tables, showing a comparison of the costs, numbers and classification of the buildings erected in San Francisco in 1913 and 1914:

1913		
Classification.	Number.	Amount.
Class "A"	21	$ 4,037,543.00
Class "B"	23	1,437,138.00
Class "C"	235	6,361,936.00
Frame bldgs.	2131	7,242,271.00
Alterations	3196	1,758,376.00
Total		$21,037,264.00

1914		
Classification.	Number.	Amount.
Class "A"	11	$ 384,800.00
Class "B"	7	511,900.00
Class "C"	157	4,495,038.00
Frame bldgs.	1920	6,669,723.00
Alterations	3718	1,775,362.00
Exposition bldgs.	82	9,943,577.00
Public bldgs.	12	4,397,163.00
Total		$28,177,563.00

The public buildings erected during 1913 are not segregated as in the case of the year 1914.

With the Exposition structures, nearly all of which should be in the frame classification, deducted from the 1914 total amount, the building permits would have been $18,233,986.00, making a decrease over the total of 1914 of $2,803,278.00.

Big Irrigation Project

Pierre Zucco has been appointed engineer for the California Farm & Irrition Company, with offices in San Francisco and lands at Blythe, Riverside county, Cal. Mr. Zucco is now preparing the plans for an extensive irrigation scheme which includes a concrete dam, reservoir and power plant.

Zucco is also consulting engineer for the Pacific Gas and Electric Company of San Francisco.

Architect Sawyer Busy

Architect Houghton Sawyer of San Francisco, has prepared plans for a $15,000 reinforced concrete warehouse to be erected in Los Angeles for the General Chemical Company, whose head offices are in San Francisco. Mr. Sawyer also has completed plans for extensive alterations and additions to the country home of E. S. Heller at Atherton, San Mateo county.

American Can Company to Build

It has been announced that the American Can Company, whose executive offices are in the Mills Building, San Francisco, will soon commence the construction of one or more reinforced concrete factory buildings in South San Francisco. A desirable site has recently been secured in the vicinity of the Union Iron Works.

More About the International Engineering Congress, 1915

The following circular of information has been sent out by the Executive Committee of the International Engineering Congress, with headquarters in the Foxcroft Building, San Francisco:

Some confusion seems to have arisen in the minds of at least certain of the engineers of this country, between the International Electrical Congress, which it was proposed to hold in San Francisco in September, 1915, and the International Engineering Congress, which IS TO BE HELD during the same month.

Owing to the unfortunate situation existing abroad, and the impossibility of convening the International Electrotechnical Commission, under whose authorization the Electrical Congress was to have been held, it has been decided by the governing body of the American Institute of Electrical Engineers to indefinitely postpone the holding of the Electrical Congress. This does not affect the International Engineering Congress, which goes ahead as originally planned.

Marked progress is being made in connection with the latter, and papers have already been received from several of the foreign countries, and everything points to a successful issue.

The committee of management of the Congress wishes to impress upon all engineers of the country its earnest desire for the support of the whole engineering fraternity, and feels that the volumes which will be received by those who subscribe to the Congress will be a very adequate return for the subscription fee.

Discount for Cash

A Wisconsin city is going to run its business on a cash basis. It will pay cash for everything it buys, and as a cash customer it will demand that every person doing business with it allow it the same discount that would be given to any private firm. This plan, it is stated, is to apply, not only to the purchase of supplies, but also to work done under contract. Details regarding the last mentioned feature are lacking, but it is probable that the city purchasing agent will take the discounts from the monthly estimates. Contractors will be glad to know that they will be paid in cash instead of bonds or warrants, but this deduction of, say 2 per cent, from their hard-earned money simply because the city meets its obligations promptly is a different proposition. It would be manifestly unfair to apply this provision to work already under contract. For future work, however, it will not be so bad, for the contractor can protect himself by making allowance in his bid for the discounts.

Mineral Exhibit

The California State Mining Bureau will exhibit at the Panama-Pacific International Exposition. About four hundred square feet of floor space in the Mines and Metallurgy Building will be devoted to case exhibits of California's mineral products. Fletcher McN. Hamilton, State Mineralogist, will detail from his staff a competent mining engineer whose duty it will be to furnish information to visitors as to the extent and value of our mineral resources.

Review of Recent Books

of Interest to the

Architectural and Engineering Professions

By CHARLES HENRY CHENEY

COUNTRY HOUSES. By Aymar Embury II.

Every designer of country houses will want to have in his library this book of photographs of Mr. Embury's work. So many mixed collections of good, mediocre and bad domestic architecture have been offered to us of late that it is a great relief to find this volume of 74 full-page illustrations and plans, each showing a small house completely studied and in satisfying good taste. While Mr. Embury holds to the best traditions of English and Dutch colonial architecture, his planning is thoroughly up-to-date, and his rare genius for design is not cramped or stilted. If somewhat freer than the exquisitely finished and conservative houses of Charles A. Platt, Mr. Embury's work sets an unusually high standard for American domestic buildings. Surely no cultured man could look upon these houses and not say, "This is architecture."

Published by Doubleday, Page & Company, New York. $3 net.

THE PRACTICAL BOOK OF GARDEN ARCHITECTURE. By Phebe Westcott Humphreys.

While essentially a book for the client rather than the designer, with photographs of many sides of Garden Architecture, this volume gives us more variety of impression than is usually crowded into one small book. Seldom is the word "practical" to be found associated with such appropriate, artistic selections. Restfulness and repose, so generally violated in the building of new gardens, are characteristic of the designs reproduced. The 125 illustrations are from actual gardens, showing effective gates and gateways, walk paving, terrace walls, lakes, pools, garden houses and furniture, decorated tree houses, arches, bird houses, etc.

Published by J. B. Lippincott Co., Philadelphia. $5 net.

EVERYMAN'S ENCYCLOPAEDIA.

A small, compact reference encyclopaedia in twelve volumes, pocket size, which serves conveniently the need for rapid information on affairs of everyday life. Brief in statement of essential facts it commends itself for that reason to the busy man, who will seldom find use for any greater list of subjects. It has distinct advantage over other encyclopaedias in the handy size and reasonable price at which it is offered.

Published by E. P. Dutton, New York. $8 reinforced cloth; $10 leather; $12 quarter pigskin.

GRAPHIC METHODS FOR PRESENTING FACTS. By Willard C. Brinton.

It is vital to the profession to get clearly before clients or the public in simple, striking form the conclusions on any line of investigation, charts or maps. Plotted curves and flat architectural drawings mean very little to the average man, hence this book of Graphic Methods for Presenting Facts goes a long way in helping the presentation by engineers of their technical findings in simple picture form. While not the last word on how to make people see things, it goes a long way in the right direction.

Published by The Engineering Magazine, New York.

PROCEEDINGS OF THE SIXTH NATIONAL CONFERENCE ON CITY PLANNING, 1914.

City planning is making such strides on the American continent that it would be difficult to keep up with the latest practical developments, or with the legal problems continually cropping up, were it not for such organizations as the National City Planning Conference. This book of proceedings is full of serious suggestions and well thought out papers on the various problems now confronting practical city planners and all who are in any way in touch with such civic work. It is a handy reference book for progressive architects and engineers.

Published by the National City Planning Conference, 19 Congress street, Boston. $2 net.

BOOKS ON ARCHITECTURE IN BOSTON PUBLIC LIBRARY.

This catalogue furnishes a valuable bibliography of architecture and allied subjects, which it is at times convenient to have.

Published by the Boston Public Library. $2 net.

HOUSING LAWS IN THE UNITED STATES AND CANADA—A summary.

A careful and interesting summary of housing laws in this country and Canada, as compared with the model law of Lawrence Veiller. It has prime interest

and importance to those working on housing codes or for housing betterment. Published by Minneapolis Civic and Commerce Association. 75c net.

Other Books Received

THE PITTSBURGH SURVEY.—(Review later.)

Vol. 1—THE PITTSBURGH DISTRICT, Civic Conditions. Postpaid, $2.70.

Vol. 2—WAGE-EARNING PITTSBURGH. Postpaid, $1.72.

Vol. 3—WORK-ACCIDENTS AND THE LAW. Postpaid, $1.72.

Vol. 4—WOMEN AND THE TRADES. Postpaid, $1.72.

Vol. 5—HOMESTEAD: THE HOUSEHOLDS OF A MILL TOWN. Postpaid, $1.70.

Vol. 6—THE STEEL WORKERS. Postpaid, $1.73.

THE COMMUTER'S GARDEN. By Kenyon Cox. Scribner's. New York. $1.50 net. (Review later.)

THE MINISTRY OF ART. By Ralph Adams Cram. Houghton-Mifflin Co., Boston. $1.50 net. (Review later.)

A GUIDE TO GOTHIC ARCHITECTURE. By T. Francis Bumpus. Dodd-Mead Co. New York. $3 net. (Review later.)

INDIAN BLANKETS AND THEIR MAKERS. By George Wharton James. A. C. McClurg & Co. Chicago. $4 net. (Review later.)

PROCEEDINGS OF THE BRITISH IMPERIAL HEALTH CONFERENCE (including Housing). (Review later.)

THE EFFECT OF SMOKE ON BUILDING MATERIALS AND SOME ENGINEERING FACTS ON PITTSBURGH SMOKE PROBLEM. Bulletins 6 and 8. Mellon Inst. of Indust. Research. (Review later.)

THE ART OF THE LOW COUNTRY. Valentiner, Doubleday, Page & Co. $2.50 net. (Review later.)

Sub-Contractors' Claims Ordered Paid by Court

Federal Judge Van Fleet of San Francisco recently ordered the claims, aggregating about $70,000, of several contractors who helped to complete the annex of the Sacramento Postoffice, paid, in a decision rendered against Ambrose B. Stannard, the main contractor, and his sureties, the Illinois and the National Surety Companies.

Stannard had agreed with the Government authorities to pay all the sub-contractors who furnished labor and material for the annex. He failed to keep his promise and the suit, the trial of which was held by Federal Judge Van Fleet in Sacramento last April, followed. Stannard agreed that the claims of the sub-contractors were just, but he urged that the suit was prematurely brought on the grounds that he had not made a final settlement with the Government.

The court held that with the exception of a few minor details Stannard's business with the United States was ended. The victorious sub-contractors are: A. Teichert. Home Manufacturing Company, D. Zelinsky, W. P. Fuller & Company, and the Pacific Floor Sanding Company..

Cement Plant for Porterville

Deals are reported to have been closed by representatives of the Riverside Portland Cement Company for the purchase of 1,000 acres of cement and lime rock lands in the Springfield district, near Porterville, and while there has been some effort on the part of the owners of the land to keep the deal secret, it is known that the purchase implies the early removal to this district of at least a part of the big industrial enterprise from the Riverside section. The Southern California plant has been fighting perennial lawsuits brought by owners of orange groves, who claim the oranges are injured by dust from the cement works.

"Pacific" Sanitary Ware

The following letter is self-explanatory:

To the Editor:—Due to the fact that there has been some misunderstanding on account of the recent importation of an eastern sanitary ware having a name somewhat similar to ours, we wish to state that all enameled iron ware made at Richmond, California, is sold and known as "Pacific" ware, and under no other name.

We also wish to announce to the interested public that Mr. Newton W. Stern has succeeded Mr. Euphrat as general manager of our company, and that the latter has not been connected with our company in any way for the last six months.

PACIFIC SANITARY MANUFACTURING CO.,
By N. W. STERN.

Plans for Shredded Wheat Factory

Working drawings for the Shredded Wheat factory to be erected in Oakland have been finished by Architects Hobart & Cheney, Crocker Building, San Francisco. Construction will be reinforced concrete, and the total cost will be approximately $125,000.

Two Stockton Buildings

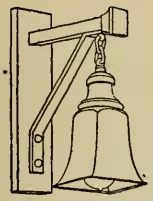
Architect Glenn Allen, Monadnock Building, San Francisco, is preparing plans for a Class "C" lodge building for the Stockton Moose, also a hotel building which will be built adjoining to the Mooses' home. Both buildings will involve an expenditure of more than $100,000.

$50,000 Residence

Architects Hunt and Burns, 701 Laughlin Building, Los Angeles, have made drawings for a large residence to be erected at Beverly Hills for Henry D. Lombard of Beverly. The cost will be about $50,000.

May Hold Competition

The Sacramento Bee says that Architect R. A. Herold may not draw plans for a $208,000 Hall of Justice for the city as there may be a competition. Architect Charles Hemmings has made a written offer to the City Commission to draw the plans for $9,250, it is said, and the offer will be acted on by the Commission later.



Heating and Lighting

Plumbing and Electrical Work

The Electric Contractor

By C. F. BUTTE

(Continued from January Number.)

THE method of handling your material in your stockrooms and at the buildings can increase or decrease your ultimate cost.

In regard to the purchase price of materials naturally one would believe that the maximum quantity discount is the proper method to reduce the cost of your work. While this deduction may seem real upon first glance, yet dead stock on your shelves is the same as dead wood in the firm, both eating profits and values. The quantity of any item that a contractor should purchase depends upon the margin of discounts and the length of time it will require to use up the entire lot of goods.

I believe the depreciation of value for old stock on hand at time of inventory is practically unknown to most contractors, but many of the larger supply houses depreciate 50 per cent and some 100 per cent any stock that has not moved for one year. The aim of most larger firms in regard to stock on hand is to order three months' supply and not more.

The contractor many times deceives himself by purchasing large quantities to get an extra 2½ or 5 per cent and in the end he must try to work off a lot of junk and old stock which requires effort and time, increasing his final costs.

I do not want to be understood as advocating small purchases, but I do advocate economical purchases and in quantities to meet your live demands.

A stock record would show in what quantity you would be justified to purchase your supplies and with your net discount sheets and by a few hours' application of human efficiency you will be able to determine the sizes of your orders.

With proper attention by the contractor to this point, a common source of dissatisfaction between the contractor and jobber could be remedied and the amount of protection a jobber could give the contractor over an occasional large outside purchaser could be more easily determined. The jobbers point out that the contractor is prone to purchase in small quantities irrespective of his requirements and justly contends that the small orders cannot be handled without losing money. In this case the buyer is paying for his own extravagance, because the deficit has to be made up. One of the things that the small buyer must realize is that hand-to-mouth methods in the purchase of electrical supplies is an extravagance. He could save himself considerable money in a year if he could buy a goodly proportion of his material at maximum discount rates. In this way he could economize on cartage charges, could eliminate mistakes, and be in pocket just the difference that the jobber has to charge against him for handling his small, unprofitable orders, and what would be required to supply the same amount of material in the same period of time in bulk, thereby increasing profits.

The placing of future delivery orders for work not started should be done by every contractor, especially when the market is low.

Labor cost is an item in every contract that must be watched closely and with assiduity. As I have stated before an excessive cost of labor on a job is not always the fault of the workman, although the moral attitude, the physical temperament and the mental state of the men materially affect the total cost. The selection of honest, sober, industrious men with good health, moral habits, a cheerful disposition and some interest in their work should keep the cost of labor on an even basis and at the least possible amount.

The best results can be obtained by associating closely as possible with your men. The feeling that the contractor will take advantage of his employees whenever possible should not exist but fair play should exist at all times with a consistent, regular and even basis of working. A spasmodic encouragement of your men, either by temporary increase of pay, or promises of long employment, does not engender harmony or sincerity either to yourself or your fellow contractors.

The method of keeping cost records, I will not touch upon, though I want to say that the contractor who states he does not keep any cost record, as he cannot keep it accurately in all details, should refer to my previous remarks on overhead expense and memorize the last part:

There were thirty-nine reasons all togther
Why I failed and was put on the "run."
The thirty-ninth and most important was—
I should never have begun.

The association of men, of crafts, is known in history as far back as the second and third centuries B. C., and has been generally induced for the pleasures of mu-

tual enjoyment, for the advancement of intellect, for the attainment of some common cause, for which the support and co-operation of numbers were necessary.

The objects of our association and the reasons for our banding together are many fold, but primarily and practically we are banded together for one purpose of benefiting our business.

"Benefiting our business" can be applied, interpreted and defined in many ways and it is true we must apply efforts, work and energies in many ways to obtain this result. However, no matter what we do, what we can do or what we will do, will always and can always be encompassed within and defined by the word educational.

The adoption of standard materials is educational, the adoption of standard specifications is educational, the application of overhead expense in estimating is educational, the addition of a reasonable profit to our work is educational, adoption of any mutual agreements is educational and in fact we cannot act in any way or manner unless it is educational. These are all educational in the sense that we must show how any action we may take or advocate will, when applied, correct faults and errors, elevate our business, prove of value, increase our capacities, save our expenditure for expense items, give our customers a higher grade of work, and increase our revenues and profits.

There are many ways in which our association will endeavor to obtain better conditions in our business. Each and every one requires sacrifice of time, a great deal of real work and many efforts by our members, as through collective working we can only obtain anything of real sound value.

The success of any organization depends upon holding out to its members something of mutual benefit rather than benefits of an individual character. Personal differences or individual benefits must never be permitted to exist in any association, as nothing is more harmful to the affiliating of men necessarily of different temperaments and characters as this one point. Continual mutual development must take place to create the feeling of mutual help, mutual enjoyment and mutual encouragement in good endeavor and it must and will be the aim of our association to always bear these words in mind.

The work of our association during the past will bear out my assertion that the personal equation is always eliminated in the efforts put forth. With the experience gained in this work, the results we have already obtain and with the spirit of co-operation more firmly imbedded than ever heretofore, the success, the benefits and the value the association will be to the contractor and to the many allied branches dealing with the contractor will unquestionably and without argument be many fold greater than it has ever been heretofore.

Many good deeds, many good efforts and many good results are yet to be part of the work our association will undertake, and I say our association for you, and you constitute our association and the good deeds, good efforts and the good results are only part of your work.

Standardization is now one of the questions foremost in all lines of industry.

All manufacturers of the present age endeavor to standardize their product. All business houses of note standardize their methods and why should not we standardize our work? Why should not we benefit by the experience of others? Why should we not grasp and obtain all the benefits possible that we may see others enjoy?

Standardization of materials now seems to be a vital question. Why should we be compelled to purchase a small quantity of a certain kind of material for one contract when our shelves are filled with material of the same quality, but of a different kind or make? Our association should take up the question of standardizing quality and not make, in order that the standard stocks carried by any contractor can be used on all his work. Along these lines I may quote a clipping as follows:

"The Engineering Association of China, having headquarters at Shanghai, has undertaken the standardization of electrical supplies throughout China. This is proving a rather difficult undertaking because of the great variety of supplies now shipped into China from various parts of the world. It is recognized, however, that far-reaching benefits would result from the proposed standardization, and as a result the consuming public is encouraging the movement."

The standard specifications and specifications drawn up by engineers and specialists should be advocated by our association. Specifications drawn up by engineers not endeavoring to sell any particular make or brand of materials, but rather specifying standard quality should also be advocated by this association. The relationship the contractor should have with the engineer you will hear thoroughly discussed and I will not take up any of your time on this subject.

The handling of legislative matters pertaining to electrical construction and installation work has been always well kept in hand by our association and the possibilities along these lines in the future are great. The values we may obtain by proper legislation are considerable if our efforts are properly applied along these lines, as it is possible to enforce the keeping up of quality and standard by means of ordinances and laws when properly drawn up. Licensing of the electrical contractors has been receiving much attention of late throughout the entire country. A license tends to fix the responsibility of the contractor and enforces him to comply with all regulations

and the National Code, it also tends to place the business on a higher plane.

The matter of interpreting N. E. C. rules and local ordinances is of great importance and with co-operative work between the California Inspectors' Association and our association, much good can be accomplished. The necessity of uniform interpretation is essential to standardization of construction work and the spirit shown by the California Inspectors' Association in assembling in Sacramento during our convention assures the fulfillment of our efforts along these lines.

The standardization of telephone construction work within buildings has been actively advanced by the telephone company and with the co-operation of our association the standards they now have in press and which apply to the entire Pacific Coast will become effective, redounding to our benefit and advancement.

There are many other questions that can only be handled and solved by the collective efforts of an association, which I will not endeavor to touch upon at this time.

In conclusion I want to talk to the man who makes the query "*What do I get out of the association?*" Yes! What do *you* get out of the association? Do you ask the same question when you undertake anythings? No—emphatically no. You expect hope and anticipate that you may get something and work like hell to fulfill your expectations, hopes and anticipations. You never stop at the start before beginning and ask this self same question, nor do you never start at all and stay asking the question.

What would this wonderful and glorious country of ours be today, if our forefathers never started, never undertook anything, never pioneered anything, but did nothing and asked the question—What do I get out of it?

Did George Washington, the father of our country, ask this question when he crossed the Delaware on that stormy, freezing night and made the beginning of our glorious country possible? Did Abraham Lincoln, as he guarded the integrity, the welfare and the future life of our glorious states and Union during the days and nights of the strife of '61 ask this question? Did the pioneers of '49 as they started across unknown territories, unknown lands, beset by all hardships, dangers and risks—ask this question and sit idly at their original locations? No—again, emphatically no, as you today would not be and could not be enjoying the delights of our beloved State, our fertile valleys and our wonderful resources. Then, why do you sit idly at your desk, table or counter and ask this self same question? Did our mothers ask this same question as they spent sleepless nights, hours of anxiety, and days of solicitude; as they watched, protected and cared for you and me?

No, gentlemen, no. The reward each expected to obtain was through efforts, through endeavors, through struggles and exertions with the fond hope, the fond expectations that such efforts may result in good.

Now, gentlemen, who ask this question—what do I get out of it—become a member, become a worker, become a part of the whole endeavor and assist the association in its work of mutual encouragement in good endeavor and when you see the results of your work and aid, you will wonder why you asked the question—What do I get out of it?

Practical Aspects of Electric Heating

IN the application of electric heaters for warming purposes the practice followed in the equipment of street cars is furnishing some valuable data. In a paper, for instance, by William S. Hammond, Jr., vice-president of the Consolidated Car Heating Company, presented at the recent summer meeting of the American Society of Heating and Ventilating Engineers, the speaker had some interesting things to say on the general subject, as well as on its bearing in connection with the heating of street cars.

After calling attention to the fact that the highest efficiencies in such apparatus as steam boilers, steam engines and electric motors are attained in large and well-proportioned units, the speaker stated that in electric heating, large and small heating units are equally efficient and for this reason electric heaters readily adapt themselves for use in locations widely separated and in which small amounts of heat are required. Dividing electric heat into a large number of small units does not, therefore, mean loss of efficiency.

100% OF EFFICIENCY REALIZED IN ELECTRIC HEATERS

The high efficiency of electric heaters is due to the fact that the electric heater is the only form of translating device in which 100% efficiency is realized. It is well known that energy is indestructible. It is wholly converted in every translating device. It is true that translating devices generally convert energy into several forms and therefore, any one form of energy contains less than the whole. Electrical apparatus generally transforms into the desired form of energy less than 100%. Now if the theory of the conservation or persistence of force is true, all of the energy can be accounted for in some way.

Let us examine, for a moment, the forms of energy into which electricity may be converted, first, mechanical motion; second, chemical action; third, light; fourth, magnetism and fifth, heat. This list, the author believes, comprises all possible forms of power into which electrical energy may be transformed.

By reference to the table, the author has attempted to show some of these transformations.

100 UNITS OF ELECTRICAL ENERGY TRANSFORMED

By	Electrolysis	Motor	Lamp	Electricity
Mechanical action	..	90	..	..
Chemical action	50	..	..	..
Light	..	..	10	..
Magnetism	..	2	..	..
Heat	50	8	90	100
Total	100	100	100	100

It is assumed that we transform 100 units of electrical energy by different devices. Out of 100 units of electrical energy employed in the operation of electrolysis, we find that no mechanical motion is produced, chemical action 50%, no light, no magnetism and 50% of heat is produced, or a combined total efficiency of 100%. If we take the electric motor, we find that it is impossible to build an electric motor without resistance, and when a current passes through this motor we always obtain heat. Therefore, in 100 units of electrical energy which are transformed in the motor 90% approximately, may be transformed into mechanical motion, no chemical action is produced, no light, two units transformed into magnetism and eight units in the form of heat, giving us a total of units of energy in these different forms of force of 100, or exactly equivalent to the number of units of electrical energy with which we started.

If now, we consider the incandescent electric lamp and transform 100 units of electrical energy, we find no mechanical motion is produced, no chemical action, about 10% in the form of light, no magnetism and 90% of heat.

Of course it is apparent that the so-called efficiency of each of these transformations depends upon the useful work which we are endeavoring to produce with the electric current. If it is the electric motor, 90% is realized. If the incandescent lamp, 10%, although, if we were using the incandescent lamp as an electric heater, we would call its efficiency 90%, instead of 10%.

We then come to the transformation in an electric heater. Again, we will employ 100 units of electric energy. We find that there is no mechanical motion, there is no chemical action, no light, no magnetism. Heat, therefore, must be the only form of energy into which the 100 units of electric energy have been transformed. The electric heater, then, is the only case that comes within our knowledge where 100 units of electric energy may be transformed into 100 units of any other one form of force.

FIXED RELATION BETWEEN ELECTRIC ENERGY AND HEAT

The fixed relation between electric energy and heat makes it easy to determine the amount of electric energy which is equivalent to a unit of heat. Careful tests have determined upon 1,047 watts as equivalent to 1 B. T. U. or 1 lb. degree F. Therefore, it becomes an easy matter to determine the exact amount of heat which is produced in electric heaters when the consumption of current is known.

For example, if we find the number of watts, by multiplying the number of amperes passing through the heater by the difference of voltage of the heater terminals and then divide the number of watts by 1,047, we will have for a quotient the number of British thermal units of heat generated in the electric heater per second. If we consider the electric heaters in a car to be using as a maximum 12 amperes of current on a 500-volt circuit, we will find that 12 amperes of current multiplied by 500 will give us 6,000 watts. Dividing 6,000 watts by 1,047, we obtain 5.73 B. T. U. of heat generated in the car per second. Multiplying 5.73 B. T. U. by 60 will give us 343.8 B. T. U. per minute. This is equivalent to 20,628 B. T. U. per hour; or, since a B. T. U. is the amount of heat necessary to raise 1 lb. of water 1° F., the heat generated per hour would be equivalent to the raising of 20,628 lbs. of water 1° F.

In this way, with a given consumption of current, it is very easy to determine exact values in heat units, or if we know what heat units are required, it is a simple matter to ascertain the exact consumption of electric energy necessary to produce this amount of heat by means of the electric heater.

Gets Splendid Business Proposition

Considerable interest is attached to the announcement that Mr. Garfield Myers has become the direct factory representative in San Francisco of the Insley Manufacturing Company of Indianapolis, Ind., the Marsh-Capron Manufacturing Company of Chicago, and the Mead-Morrison Company of Boston, three of the largest concrete machinery enterprises in the country. Mr. Myers has opened offices in the Hearst building. He is recognized as one of the best-informed concrete machinery men on the Pacific coast, and is thoroughly familiar with the local situation. He has lately been connected with the construction department of Parrott & Company, prior to which he was a member of the firm of Langford, Feltz & Myers, with offices in the Rialto building.

For a number of years Mr. Myers handled the Ransome mixer business for the Norman B. Livermore Company.

Otis Elevator Has Fine Display at Exposition

THE Otis Elevator Company has worked out a most attractive scheme of decoration for its space in the exposition Palace of Machinery, forming a natural and artistic setting for its exhibit of elevator machines.

Most electric elevator machines of the larger type are located over the hatchways at the top of the building—many in pent houses on the roof. This condition has been taken advantage of to turn the space into a reproduction of a typical roof garden in one of our large cities, with pent houses inclosing the elevator machines.

As the visitor steps through one of the gracefully arched entrances, between classic pilasters surmounted by a cornice extending across the entire front and interlaced with lattice work, he might easily imagine himself in the roof garden of a popular hotel. An arrangement of pergolas, thickly entwined with foliage and studded with the dim lights of varicolored bulbs, produces a rich, restful effect, while through the glass panels of the pent houses, which are softly lighted by the indirect system, are seen the elevator machines as they would appear in an actual installation.

Looking over the roof parapet on the right, the visitor sees the familiar mass of towering skyscrapers of lower New York. The buildings are dotted with twinkling lights and through the lighted windows of the tallest buildings can be seen miniature elevators in motion. Walking along the ninety-two-foot length of the booth to the other end, the visitor looks out over the city of San Francisco and here again may be seen miniature elevators at work in the principal buildings.

The pent houses—three in number—are arranged along the rear of the roof and are so constructed as to allow a close inspection of the elevator machines from all sides.

In pent house No. 1 is an Otis 1:1 gearless traction elevator machine, complete with controller and governor. A car switch on the outer wall of the pent house controls the operation of the machine. Alongside of this pent house is shown the car safety device used with this type of machine, and its method of operation. A stopping switch and hatchway limit switches mounted above the safety device illustrates the action of these switches on the safety, independent of the car switch operation.

In pent house No. 2 is located an Otis 2:1 gearless traction elevator machine with governor and controller. This type of machine is particularly interesting because of its wide application for use in buildings of moderate height, although it still retains the gearless drive principle found in its larger contemporary, the 1:1 type of gearless machine.

In pent house No. 3 is an Otis worm gear traction machine for alternating current circuits, with variable speed control. The company's pioneer work in alternating current apparatus lends peculiar interest to this machine, which is arranged for two-sped operation.

In this portion of the Otis exhibit there is illustrated by picture and description the progress of the power elevator from its invention, through its various stages of steam, hydraulic and electric motive power, to its present development; a story of how Otis elevators are made safe to ride in and the purposes and uses of escalators, inclined elevators and incline railway.

In the remaining space allotted to the company, just south of a subentrance to the building, will be seen an automatic push button elevator in operation. This machine has been installed for the use of exposition officials, but it will be so constructed that the machine and hatchway will serve as an interesting exhibition for visitors.

The Otis exhibit may be said to be at once original, dignified and beautiful. The visitor will find no more interesting exhibit in the Palace of Machinery.

Personal Side of the Millwork Question

Architects, builders and even the owners themselves appreciate a planing mill where the interest does not cease after the material is loaded on the truck or car. They like to have the interest continue till the work is delivered and set in place. The experience of many contractors is that few mills give this personal interest and service. From what has been gleaned from many builders the Dudfield Lumber Company of Palo Alto, Cal., is a mill well known for giving all their jobs this personal attention, from the simplest to the most intricate details. This is especially appreciated in the case of the many beautiful country homes "down the Peninsula" on which the Dudfield Company has supplied the millwork.

Some of their recent work has been the Harry Haehl residence in Palo Alto; the Half Moon Bay Catholic Church, Welch & Carey, architects; the M. J. Brandenstein residence at Fair Oaks, Albert Farr, architect; a home for Mr. Hill, of Hills Bros.; the residence of J. E. Fisher at San Jose, and the recently completed Sunnyvale School, F. D. Wolfe, architect.

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

Road Construction Plant and the Contractor

UPON undertaking road construction it is required to be determined what type of construction plant is best suited to the work in hand, how much plant is required to complete the work with the greatest economy and profit, and what additional plant is required to expedite construction so that time limitations will not be exceeded.

Every construction project has certain fixed limitations within which the contractor must keep in planning work to be accomplished. These limits may be due to varied and uncontrollable causes, such as the type and number of laborers available, the location of the project with reference to bases of supplies, the length of profitable working season, topographic conditions with reference to ease of hauling and as affecting the installation and use of plant, climatic conditions during the working season—a most important factor—and facilities for quickly and profitably disposing of or storing plant after the completion of the work. Moreover, on contract work specifications invariably define other limits, such as the time of completion, the type and quality of material to be used, involving possible delay in securing materials at the proper time and consequent disorganization and loss to the contractor, and the possibility of important changes in the plan and extent of the work while in progress.

The foregoing are the broad general conditions confronting the contractor upon undertaking road construction work. In attacking this equipment problem the three important questions to answer are: What plant is best suited to the work, how shall it be acquired, and what will be its value after the completion of the work? In answering these questions sound experience is undoubtedly of greatest value in the proper correlation and nice weighing of the conditions affecting the proposed work.

There are, however, a few general rules of thumb in vogue among contractors that are worthy of mention. Plant is a substitute for labor, and its use is economical only when it will yield a good return on the investment over and above the labor cost without the use of plant. The economic ratio between plant and labor is, in a measure, a fixed quantity for each construction project. Whether or not any plant at all is needed and what is the least amount with which the work may be accomplished are fundamental questions. Finally, second-hand plant is to be avoided if the contractor expects to continue in the same line of contracting; if he expects to undertake a different type of work on the next project it may be a profitable investment.

Many contractors do not figure on plant expense when bidding on work. The first job undertaken is frequently figured with no profit other than the plant purchased. On succeeding jobs plant cost is not included, unless new plant is required. In short, the job pays for the plant. In figuring on the disposal of the plant at the conclusion of the work, as a rule, heavy machinery

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if sold will not bring to exceed 25 per cent of the first cost. Light machinery and small tools are usually worn out on the job and at its termination must be disposed of as scrap. Second-hand machinery ordinarily sells at about 50 per cent of its first cost after overhauling by machinery dealers. The salvage value of second-hand machinery but slightly used is larger than that of slightly used new machinery. In other words, the ratio of the value of third-hand to second-hand machinery is greater than second-hand to first-hand machinery.

Construction plant is the great problem of the road contractor. The cost of plant used frequently exceeds 33 per cent of the total cost of the work accomplished and seldom falls below 20 per cent. Unless plant is keenly judged, shrewdly acquired and kept constantly at work the profits of the road contractor may be continually feeding the mill in the merry-go-round of machinery purchasing.—Engineering and Contracting.

Nice Brick and Terra Cotta Contract

The Independent Sewer Pipe Company, 335 South Los Angeles street, Los Angeles, has been awarded the contract for furnishing the terra cotta and facing brick for the exterior of the seven-story reinforced concrete department store building being erected at Seventh street and Grand avenue, Los Angeles, for the J. W. Robinson Company. Frederick Noonan and William Richards, Brockman building, Los Angeles, are the architect and engineer.

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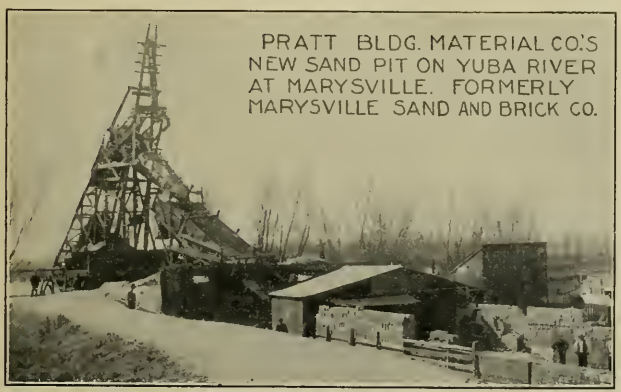

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The Best Road Material

HE vexing question as to the best material with which to build roads in these days of automobiles is concisely answered by a good roads worker out in Washington—apparently the "father" of good roads in that State—by one word —"brains." The epigram as applied to the construction of roads, or anything else, is not new, but it directs attention from speculation whether the ideal road material has been, or can be found, to the fact that whatever the material, it must be handled with intelligence. No motorist needs to go far from Springfield to point out stretches on which money seems to have been wasted, not through the fault of the material so much as in the way it was laid. For example, cemented surfaces have not always worn well, although around Detroit, the very home of the automobile and a district in which the road problem might be assumed acute, cement roads have proved notably successful. Just outside of New Haven on the way to Bridgeport a stretch of cement roadway some seven miles long was opened a few weeks ago; its wearing qualities are now the question, for the present surface is beyond criticism.

The particular complaint made by this Washington speaker at the annual convention of the State Good Roads Association in Spokane was that the State University had discontinued its course in the construction and maintenance of highways. He maintained that "ten thousand men 'can make a watch where one man can 'make a road.'" While that is obviously a rhetorical exaggeration, unless it be admitted that the country is absolutely without competent roadmakers, it is clear that roadmaking is of necessity becoming a more highly specialized affair and one which calls increasingly for vocational training and scientific study. When our Massachusetts hill towns in their desire for a revival of prosperity go deep into their own pockets to secure good roads with supplementary State aid, the loss would be a peculiarly severe one if, either through a penny wise and pound foolish policy in the use of funds or through lack of intelligence in actual construction, roads so built should lack in durability. The State authorities have here a large burden and it is to be hoped that certain stretches of road under construction last summer will confound the predictions of venturesome lay critics as to their ability to stand up under traffic.—Springfield (Mass.) Republican.

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The California Highway Bulletin

Several of the highway commissions which are now in charge of road construction in some of the most progressive states have adopted the wise policy of publishing, at more or less regular intervals, bulletins dealing with the work in their hands and intended to give the voters and taxpayers a clear idea of the way the public moneys are being expended for highways. These bulletins, by the use of many handsome photographs and by the inclusion of interesting articles which have not only technical but also literary merit, are becoming worthy of the title of magazines. The Iowa Service Bulletin is especially noteworthy. One of its most useful activities is that of vividly presenting the unfortunate and sometimes tragic results of the retention on highways traveled by modern heavy vehicles of old wooden bridges or steel structures which have become weakened by corrosion.

The high water mark in publications of this character seems to have been reached in the January, 1915, edition of the California Highway Bulletin. This periodical will compare very favorably both in appearance and in the genuine information afforded with any road building magazine published in the United States. It is well printed, well illustrated, and notably well edited. Groups of beautiful views of completed highways under the varying conditions of sea shore, valley, and mountain regions form full page illustrations. A photograph published over the caption "Building the State Highway Through Northern California Forests" would make a beautiful enlargement. Another full page is occupied by eight illustrations over the title "Type of Bridges and Culverts on California State Highway." The bridges are of concrete of modern design, which combines strength and beauty. The one illustration which represents a culvert shows the installation of twin Armco iron corrugated pipes.

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The Bulletin is printed for free distribution and anyone interested in road building may procure it by writing to the California Highway Commission, Forum building, Sacramento, and enclosing two cents in postage.

The highways of California promise to be one of the principal sources of interest and of pleasure to the thousands of visitors to the Panama-Pacific Exposition; and as a large number of these will undoubtedly make the trip by automobile, the character of these roads will be a matter of direct personal concern.

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The Building Outlook in Oregon

By A. J. CAPRON

THE past year, in the building line in Portland, has been one of unusual depression; we might say, "These be days that try men's souls." Architects have had little to do, likewise the contractor, although probably more estimates for construction have been gotten out during the past twelve months than any other year in the history of Portland, and while it ranked third or fourth in the volume of construction in the United States for the year, yet the total was much less than for several years previous. The prospects for 1915, however, are of material importance; there are quite a large number of jobs projected, and these will ge ahead as quickly as they can be financed.

Our banks are loaded with money (paradoxically when the money is in the banks it isn't in circulation). The new reserve bank feature will improve the financial situation.

One of the largest and most expensive, as well as ornate structures to be built this year will be the First National Bank building at Fifth and Stark streets, Messrs. Shepley, Rutan & Coolidge, Ames building, Boston, Mass., architects. The cost of this construction will probably exceed three-quarters of a million dollars. The building will be Class A, fireproof throughout, and devoted exclusively to the banking business. Preliminary plans provide for a high basement, or ground floor to be devoted to the security savings department, while the main floor, approached by steps, will be the bank proper, and the mezzanine floor will be devoted to the bookkeeping, and other similar work.

The Meier & Frank fireproof building, 100 x 200 feet, is progressing rapidly at this date. Eight stories of steel have been erected, and presumably the building will be fifteen stories high. This will give them an L-shaped building, which, together with the present structure of 100 feet square, will make it by far the largest in the city, if not on the Coast, devoted to department store business. This building provides for a sub-basement the same as the previous construction.

The Coin Machine Company is about to commence work upon the first unit of its building, a structure 100 x 200 feet and four stories high.

The Doernebecher Furniture Company will erect a $60,000 fireproof addition to their present and already large complement of buildings.

The O. W. R. & N. Company, together with the city of Portland, will build a large viaduct on the Sullivan's Gulch and Sandy Road Junction, involving a probable expenditure of nearly one million of dollars.

The municipality is doing a large amount of sewer and paving work, and contemplates an expenditure of several million dollars during 1915. Provided the Legislature makes the appropriation, a large Auditorium will be built for the Oregon Agricultural College at Corvallis, complete plans for which show a massive structure of classic design and capable of seating 5,000 persons. This project will involve an expenditure of over half a million dollars. Additions for other State institutions are also being provided for, the extent of the improvements depending upon the amount appropriated by the present session of the Legislature.

The interstate bridge, across the Columbia river, connecting Portland with Vancouver and the State of Washington, plans for which are completed and bids called for, will be the most important construction for Portland this year. Messrs Harrington, Howard & Ash, engineers of Kansas City, have furnished the Commission with two types of construction, the lift draw, and the swing. The former is the same as they erected for the city of Portland known as the Hawthorne avenue bridge and the O. W. R. & N. R. R. bridge, the largest of its kind in the world.

The total length of the river spans will be 5,000 feet and the approaches 12,000 feet, involving the use of 9,500 tons of steel and an estimated expenditure of $1,750,000. The engineers estimate that it will require a year's time to build the bridge, although the well-known ability of the engineers to "drive," leads us to hope that a less time may see the bridge in use. The plans show a very fine looking structure of heavy, "through span" construction. Mr. Howard is the resident engineer and will give personal attention to all details. Alternate proposals are called for and some twelve different items are included and it is hoped that this will enable the Commissioners to save some money in the construction and yet obtain the best there is, at a minimum cost. The plans call for a clear roadway thirty-eight feet in width, with a foot walk five feet wide on either side.

Three large school buildings are in process of construction for the city of Portland, at a total expenditure of over half a million dollars. In Portland, as in other cities, it is a difficult proposition to keep up the construction with the increased school attendance. An improved type of fireproof construction is contemplated in all plans. School Architect Narramore is making a good showing in his work.

The city of Portland is taking steps to remove several dilapidated buildings which are little less than fire-traps and have been a menace for several years to the adjoining buildings.

The large Courthouse, built a few years since at an expense of $2,000,000, is already proving too small for housing the various offices necessary.

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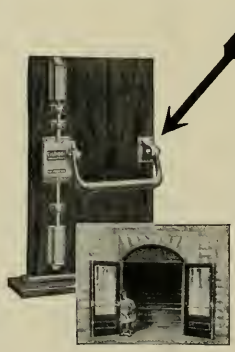

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In "Sweet's Index," Pages 770-771

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The Columbia river highway, which, from a scenic point of view, will be the finest in the United States, will be completed this year. The total cost of building this sixty miles of roadway will be $2,000,000. A great deal of rock work is necessary, and in some places the roadway is cut out of the side of perpendicular cliffs a thousand feet or more in height. It is expected this will be a drawing card for tourists and incidentally help the automobile business. Last year the city completed, at an expenditure of over $300,000, the "Terwilliger Drive" in the southern portion of the city, from which a magnificent view may be had.

The highway improvements contemplated during this year in and about Portland will involve, when completed, an expenditure of over $5,000,000, and it is considered the money is well spent. Notwithstanding the depression of business throughout the country, Postoffice receipts show a constant increase.

There seems to be no let-up in the number of smaller business blocks, and residences to be built. These, however, are not of an expensive type of construction. Sawmills and kindred lines show marked improvement. The shipment of grain to European countries, together with the material advance in prices for wheat, which has never been exceeded in the history of Portland, has brought to Portland a large fleet of vessels.

We also expect a great benefit from tourist travel due to the Panama and San Diego Expositions, and we will be materially helped by the two magnificent steamers being completed by the Hill system to ply between Portland and San Francisco. These two ships, involving a cost (aside from dock improvements) of over $5,000,000, and for their type they far exceed in completeness anything on the Coast. It is expected these steamers will make the run to San Francisco in twenty hours.

The city of Portland is completing Municipal Dock No. 2, (a fireproof structure) which, together with Dock No. 1 and the warehouse connected therewith, places Portland in the front rank for municipal-owned docks on the Coast.

Plans are being drawn for a $900,000 elevator to be located on water frontage yet to be selected.

Flour mills are running overtime. Brick manufacturing plants seem to have all they can do, likewise the tile manufacturers.

The Jason-Moore Company of New York have leased the lakes in Southern Oregon, from which they propose to extract the various products, which, with their plants and pipe lines, will involve an expenditure of two million and a half dollars, and lacks only confirmation by the Legislature to initiate the work.

The banking business is in excellent shape and the reserve banks are receiving the new currency in exchange for the old form of national bank paper.

Our new commission form of government has so far developed the new organization as to place the municipal affairs in a better working shape and it is hoped that there may be a material economy in the expenditure of public funds, and a consequent reduction in taxes. The present Legislature is pledged to economy, however they may be able to redeem those pledges. The State is growing, and it is necessary to keep up with its development.

During the past year the State Highway Commission constructed a large number of permanent bridges, Major Henry L. Bowlby, State Highway Engineer, in charge. There will be a large number built during this year. The amount of construction depends largely on the appropriation of the counties, and they seem to be fully alive to the necessity of improvement and permanent highway construction.

Taking everything into consideration, while the past year has been a severe one for everybody, yet the State of Oregon has held its own, and with a revival of good times will undoubtedly rapidly resume its former condition, and we feel hopeful for favorable results.

California Convention of Whitney Window Salesmen

One of the most interesting gatherings of building specialty salesmen held recently in San Francisco was the convention on Thursday, January 28th, of the California salesmen of the Whitney Window Company. The State offices of this company are located at 522 Sharon building. At this meeting were all the representatives of this company in California, as well as a representative of the sales force from Minnesota, and the president of the company, Mr. V. J. Whitney of Seattle, Wash.

The business of this company in California has grown so rapidly since the local office was opened last September that W. H. Pringle, the State manager, called this convention largely for the purpose of discussing some of the special problems which have been presented. An enthusiastic gathering was the result, and many prospective special contracts were worked out with great success. The convention showed that the Whitney Window is adapted to all sorts of conditions.

A banquet followed the convention, at which the following were present: V. J. Whitney, Seattle, Washington, president of the company; Leon C. Warner, Minneapolis, Minnesota, representing salesmen between the Rocky Mountains and the Mississippi river; Wm. H. Pringle, San Francisco, State manager; Carl H. Zeus, Los Angeles; Frank W. Lord, Sacramento; C. K. Grady, Northern California agent; W. B. Knapp, Oakland, and H. O. Jones, San Jose.

Early Participants in Canal Shipping

One of the first big concerns of San Francisco to take advantage of the increased facilities for shipping since the opening of the Panama Canal is White Brothers, San Francisco's well known hardwood merchants.

Another niche has been chiseled in the monument of progress through the completion of the Panama Canal, and it is with feelings of just pride and enterprise that this firm claim the distinction of being the first to ship a whole trainload of hardwood lumber through this great commercial artery to their yards in San Francisco. This lumber was cut from the virgin tracts of Northern Mississippi, loaded during the last days of October and was run as a special train over the New Orleans, Mobile and Chicago Railroad, already becoming known as the "Panama Route," direct to Mobile Alabama, then transferred to the steamer Peter H. Crowell. The steamer left Mobile November 6th via Panama Canal, arriving in San Francisco December 14th. The shipment consisted entirely of plain and quarter sawed oak of the finest quality.

The Eastern trade press gave much publicity to the event, lauding both shipper and consignee upon their achievement in sending the first entire trainload of hardwood lumber via the Panama Canal.

White Brothers have another fine shipment of hardwood due to arrive early in January on the steamer Montoso, loaded with thousands of feet of mahogany, Jenezero veneers and high-grade lignum vitae of extra size. The mahogany is genuine Honduras, sawed and dried in Long Island City. This is also a Panama Canal shipment. The steamer Pleiades is also en route from New Orleans with a large consignment of red Southern gum and white oak.

Quite a comprehensive idea of the variety and extent of the hardwood lumber carried by this firm can be obtained from a glance at their new Stock List No. 17, just published. Over a half hundred different varieties of hardwoods are listed, covering the well known floorings, veneers and finishes, also woods for ship builders, blacksmiths, carriage builders, etc.

Not having seen this list, one would never believe that such a quantity and variety of hardwood lumber was stocked by one single firm on the entire Coast.

Australian Parliament House Competition

An architectural competition for the Australian Parliament House, on the site of the new Federal Capitol of Australia, has been announced. Designs must be delivered in London or in Australia by March 31, 1915. Prizes totaling £6000 are offered, the first prize being £2000. The judges are: George T. Poole, of Australia; John James Burnet, of London and Glasgow; Victor Laloux, of Paris; Otto Wagner of Vienna; Louis H. Sullivan, an American architect with offices in the Auditorium Tower, Chicago, Ill.

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They All Call Him "The Captain"

Robert Woolston Hunt Who Has Been in the Van in Steel Making for a Lifetime is One of the Country's Foremost Engineers

By George H. Manlove.

From the Iron Trade Review, May 7, 1914.

"THE CAPTAIN", they call him, from the telephone girl at the information desk in his offices to the inspector at the outermost post of the great organization he has built up.

Who?

Why, Captain Robert Woolston Hunt, the head of Robert W. Hunt & Co., engineers.

If you ask the Captain how he earned the title, he will tell you with pride he earned it in the war of the rebellion, when he served his country at the expense of his individual interests.

But to his friends and employes he is captain of a regiment in the great army of soldiers of the common good, who are doing a work to make the world better and safer and more comfortable for us all.

And the Captain is no martinet, ruling by fear and by violent means. Far from it. He is gentle and kindly, soft spoken as a woman and without a trace of hardness. But he exacts obedience, which his helpers are glad to give.

"We all love the Captain," said one employe, and the way the title is used is an earnest of the fact, for it sounds like a term of endearment for a lovable man, whose contact with steel and iron and concrete has left him free from their characteristics.

When a skyscraper is to be built, or a bridge or a great steel plant, the services of the Captain may be had to assure the builder the materials are all they should be and that they are erected according to the specifications laid down by the designer.

With a trained corps of men who know steel and iron and concrete from the inside out, as well as the processes to give it strength and other characteristics necessary to perform its work properly, the Captain has multiplied his own power of knowledge a hundred fold and placed it where it is available for any one's use. Material inspected by the Captain's workers has his guarantee and none is better.

When the history of steel is written, the name of Robert W. Hunt will be linked with those of Bessemer, Siemens, Carnegie, Howe, Bradley, Stoughton and the rest, whose efforts have been given to developing the great industry.

He was a pioneer in the use of a laboratory for chemical analysis at a steel plant, he made the first steel rails produced in America on a commercial scale and built the first automatic rail mill tables ever used.

He was born Dec. 9, 1838, in Fallsington, Buck County, Pa. His father, Dr. Robert A. Hunt, of Trenton, N. J., was a graduate of Princeton college, and the University of Pennsylvania. His mother was Martha Lancaster Woolston.

He spent several years learning the practical side of iron-making in the rolling mills of John Burnish & Co., Pottsville, Pa., and later took a course in analytical chemistry in the laboratory of Booth, Garrett & Blair, upon the completion of which he entered the employ of the Cambria Iron Co., Johnstown, Pa., and Aug. 1, 1860, established for them the first laboratory in America as a direct part of an iron or steel organization.

In the fall of 1861, he entered the United States military service and was placed in command of Camp Curtin, Harrisburg, Pa. He served as mustering officer for the state of Pennsylvania, with the rank of captain and in 1864 assisted in recruiting Lambert's Independent Mounted Company, P. V. He was mustered into the United States service as a sergeant, having tossed up with a friend, who had also participated in recruiting the company, as to which one should receive a lieutenant's commission.

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Upon being mustered out of service, he returned to the employ of the Cambria Iron Co., and was sent by them to the experimental Bessemer works at Wyandotte, Mich., of which it was part owner. He was placed in charge of those works in July 1865, and so continued until May, 1866, when the Cambria company called him back to Johnstown to take charge of its steel business, as they intended to begin at once the erection of a Bessemer steel plant. This was not done for several years, and in the meantime, the Cambria company undertook the rolling of steel rails for the Pennsylvania Railroad Co. from ingots produced by the Pennsylvania Steel Co.'s works at Steelton, Pa., that company's rail mill not being completed. Mr. Hunt had charge of the steel for this operation, and these were said to be the first steel rails made in America on a commercial order.

Later he assisted George Fritz, Cambria's chief engineer, in designing and building their Bessemer works, and assumed charge of it on its completion, July 10, 1871, continuing until August, 1873, when he resigned his position. September 1, 1873, he entered upon the duties of superintendent of the Bessemer works of John A. Griswold & Co., Troy, N. Y. In March, 1875, he became general superintendent of the Albany & Rensselaer Iron & Steel Co., which had acquired the works of John A. Griswold & Co. and Erastus Corning & Co. This organization became later the Troy Steel & Iron Co. He remained in charge until 1888. During those years he almost completely rebuilt the various works of the company, and also erected a large blast furnace plant of the most complete character.

Mr. Hunt has taken out several letters patent on steel and iron metallurgical processes and machinery, both invidually and in conjunction with John E. Fry, Wm. R. Jones, Dr. August Wendel and Max M. Suppes. Mr. Hunt put in the first automatic rail mill tables, and later the Hunt-Jones-Suppes rail mill feed tables were used under licenses by the majority of the rail mills in the United States. On Dec. 5, 1866, he was united in marriage to Miss Eleanor Clark, of Ecourse, Mich.

In April, 1888, he established the bureau of inspection, tests and consultation of Robert W. Hunt & Co., with principal offices in Chicago, Ill., to which city he removed in the spring of 1888. He served three terms as commander of John A. Griswold Post No. 338 G. A. R., of Troy, from which position he resigned on removing from that city.

Mr. Hunt is a member of the American Institute of Mining Engineers, and was president in 1883 and again in 1906. He is a member of the American Society of Mechanical Engineers, and was president in 1890. He is a member of the Western Society of Engineers, and was president in 1893. He is also a member of the American Society of Civil Engineers, Canadian Society of Civil Engineers, The Institution of Civil Engineers, the Institution of Mechanical Engineers, and the Iron and Steel Institute of England. He is a member of the American Society for Testing Materials, and was president in 1912. He is the American member of the Council of the International Association for Testing Materials.

In 1912, by the John Fritz medal committee, representing the American Society of Civil Engineers, American Institute of Mining Engineers American Society of Mechanical Engineers and the American Institute of Electrical Engineers, he was awarded the John Fritz medal, "for his contributions to the early development of the Bessemer process."

Mr. Hunt has contributed many papers to the proceedings of the several societies, of which he is a member, and frequently lectures before scientific bodies. He is and has been for many years a trustee of the Renssalaer Polytechnic Institute, Troy, N. Y.

Mr. Hunt is a member of the Chicago Engineers, Mid-Day, Saddle and Cycle, Chicago, South Shore, Illinois Athletic, Glen View, Chicago Golf, Winnetka County, Montreal Engineers, Engineers of New York and Mexico City Country clubs. He has always been interested in out-of-door sports, and was, in his earlier life, a cricket and baseball player, and is now an enthusiastic golfer.

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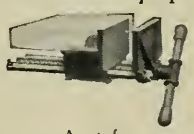

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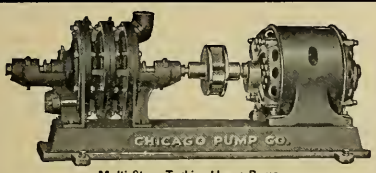

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Important Metal Furniture Contract

The contract for metal roller bookshelves for the County Auditor's office of Alameda county was awarded recently to the Capitol Sheet Metal Works in competition with several large metal furniture concerns.

This firm, which operates factories both in Oakland and San Francisco, was particularly pleased with the Oakland contract, as it indicated a distinct preference on the part of the Alameda county Supervisors for home industry. Labor, as represented by the cross-bay trade unions, was also pleased with the award.

It is a surprising fact that more than $200,000 is spent annually by California public officials for metal furniture, and it is the intention of the Capitol Sheet Metal Works to reach out for a goodly proportion of this business.

For years the firm has been a factor in all lines of regular sheet metal work, including skylights, metal doors and windows with the Underwriters' label, intricate cornice work, etc., and its installations have all been of a creditable nature.

For the Sanitary Kitchen

Something new in kitchen equipment has recently been placed on the market by the Improved Sanitary Fixture Company of 411 South Los Angeles street, Los Angeles. It is called the "Help-Her" improved sanitary kitchen sink and is exactly what the name implies. It is a refuse separator placed in the bottom of the kitchen sink, all porcelain enameled, with removable nickel-plated receptacle and strainer. The removable receptacle, out of the way, yet right at hand, without steps or stooping, receives all refuse and washings, traps and congeals grease and retains solids. It permits water, and water only, to pass into the drain-pipe. Pots, pans and dishes from the table with leavings thereon, are drenched with hot water under the faucet, without soiling or scalding the hands, scraping or scattering waste materials.

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Dahlstrom Company Keeps Up Its Enterprise

The portfolio of details of Hollow-Metal Construction which the Dahlstrom Metallic Door Company distributed the past year to architects and others interested, has met with unqualified approval and appreciation by all who have seen it.

Six new plates have recently been issued and copies may be had on application. In a personal letter to architects the company says:

"In view of our experience and knowledge of work installed we have no hesitation in asserting that the right kind of hollow-metal doors and trim in the buildings erected under your care and supervision will prove one of the most appreciated parts of the equipment you could use, and will surely reflect credit on the architect specifying and insisting on the use of Dahlstrom products.

"If parties interested in building equipment thoroughly appreciated the difference in quality of workmanship, construction and finish of hollow-metal work, the reason why we do not compete in prices would be obvious. We do claim, and our assertions have never been disputed, that we furnish the best quality of goods that can be produced, and feel that architects and clients who appreciate that the best is the cheapest in the long run are willing to pay a fair price for this grade of goods."

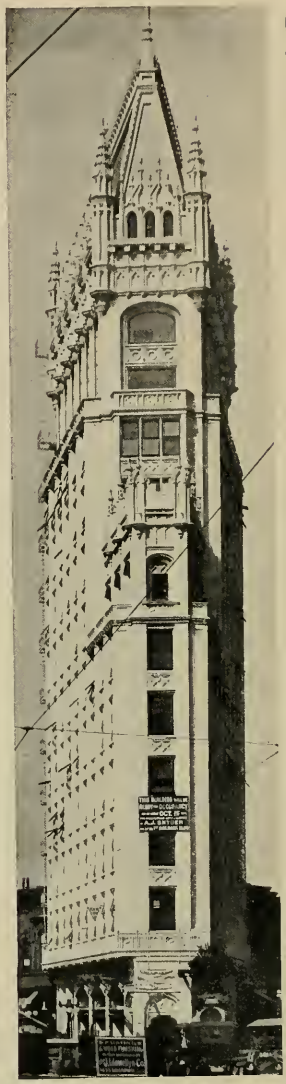
Gas from Ruud Heater Causes Serious Explosion

A press dispatch from Santa Rosa says that William H. Upton had a narrow escape from serious injury or perhaps death when a quantity of gas which had accumulated beneath a Ruud hot water heater, exploded, and the entire heater was wrecked. The article goes on to say:

In the meter room was an immense gas heater of the Ruud make, with which the apartments were kept supplied with hot water. In some manner gas had accumulated beneath and around the heater, and when Mr. Upton struck a match the explosion followed. The detonation could be heard for many blocks. The force of the explosion sprung the entire front of the machine, burst the front and rear doors, cracked the heavy case of the heater frame, burst the metal coil inside, and blew out windows in the Demmer building adjoining.

California Building Material Company in New Offices

The California Building Material Company, one of the first San Francisco concerns to put upon the market a clean, washed gravel for concrete mix, has moved its general offices from the Pacific building to Rooms 500 to 504, New Call building. This company's plant is at Niles, California. Crushed rock and gravel are shipped from here to points in California as far south as Fresno and as far north as Sacramento. The company retains its old phone number, Sutter 4845.



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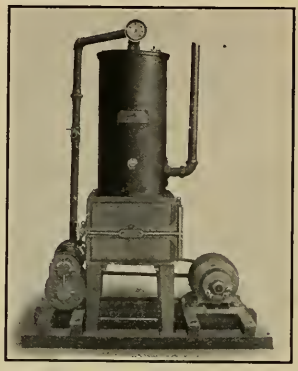

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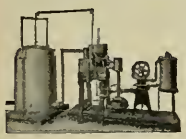

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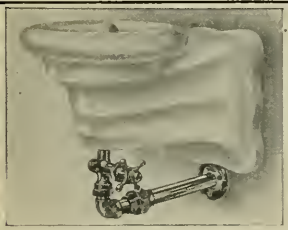

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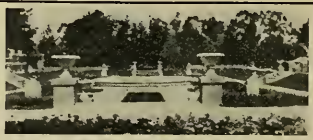

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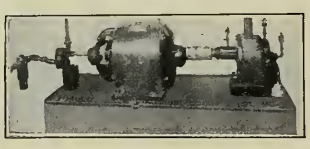

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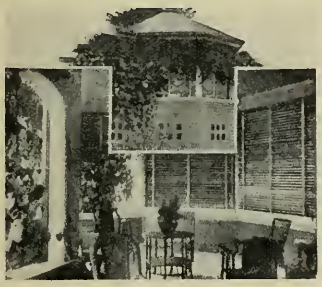

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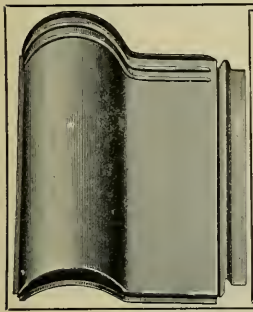

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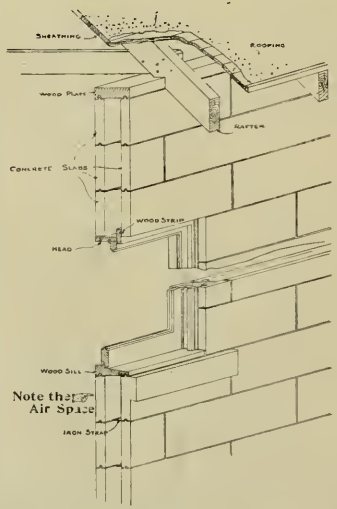

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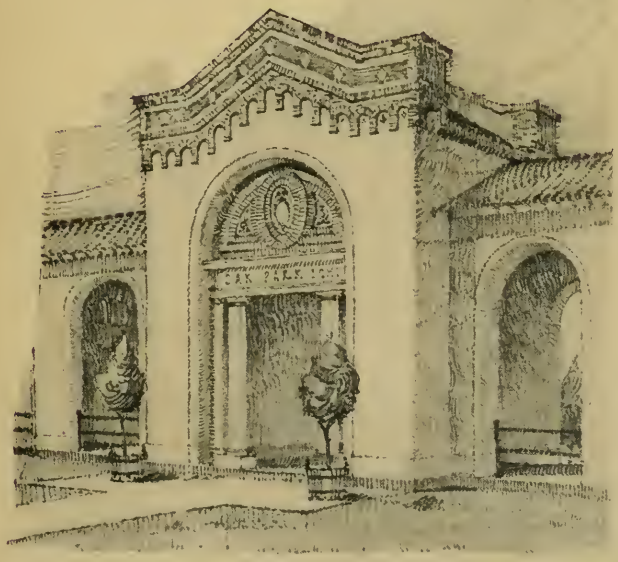

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Bennett Bros., agents for Sargent Hardware, 514 Market St., San Francisco.
Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, and Los Angeles.
Russell & Erwin Mfg. Co., Commercial Bldg., San Francisco.

BUILDING MATERIAL, SUPPLIES, ETC.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen & Co., 356 Market St., S. F.
Western Builders' Supply Co., 155 New Montgomery St., San Francisco.
Biturine Company of America, 24 California St., San Francisco.
C. Roman, 173 Jessie St., San Francisco.
C. F. Pratt Building Material Co., Hearst Bldg., San Francisco.

CASTINGS
Pacific Foundry Company, Harrison and 18th Sts., San Francisco.

CEMENT
Atlas Portland Cement Co., represented by United Materials Co. and Pacific Portland Cement Company, San Francisco.
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 9 Main St., San Francisco.
"Golden Gate," manufactured by Pacific Portland Cement Co., Pacific Bldg., San Francisco.

"GRANT CONCRETE MIX" The only properly proportioned mix in this market. Composed of hard, clean, fresh-water gravel, free from sand stone, and contains about 25% of crushed rock and necessary amount of sand.

WE GUARANTEE LESS THAN 25% VOIDS.

Used on many important first-class buildings and road work. Accepted on all City, State and U. S. Government work.

GRANT GRAVEL COMPANY
FLATIRON BLDG., Phone Sutter 1582, SAN FRANCISCO

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Telephone
Sunset So.
6558.
Home 24338.

The Edwin H. Flagg Scenic Co. Inc.

LARGEST
THEATRE
OUTFITTERS
IN AMERICA

DROP CURTAINS, SCENERY, SUPPLIES, DECORATIONS

SPECIAL WESTERN AGENTS J. R. CLANCY, SYRACUSE, N.Y., STAGE HARDWARE.

1638 Long Beach Ave., Los Angeles. 143 W. 42d St., New York City. 502 Westbank Bldg., San Francisco

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT—Continued.
Medusa White Portland Cement, sold by Building Material Co., Inc., Monadnock Bldg., San Francisco.

CEMENT EXTERIOR WATERPROOF COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See distributing Agents on page 30.)
Biturine Co., of America, 24 California St., San Francisco.
"Impervite" sold by E. A. Bullis & Co. (See advertisement on page 26.)
Imperial Waterproofing, manufactured by Imperial Co., 183 Stevenson St., San Francisco.
Trus-Con Par-Seal, made by Trussed Concrete Steel Co. (See Adv. for Coast agencies.)

CEMENT EXTERIOR FINISH
Biturine Company of America, 24 California St., San Francisco.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents on page 30.)
Dry Mortar Colors sold by E. A. Bullis & Co. (See advertisement, page 26.)
Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., San Francisco.
Concrete Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents on page 30.)
"Federal Steel Cement Hardener" manufactured by Federal Steel Cement Mills, Cleveland, represented by E. A. Bullis & Co. (See advertisement, page 26.)

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS
Fink & Schindler, 218 13th St., San Francisco.

CHUTES—GRAVITY SPIRAL
Gravity Spiral Chutes by Minnesota Manufacturers' Association. G. E. Sturgis, Agt., 602 Mission St., San Francisco.
Insley Gravity System for pouring concrete, represented by Garfield Myers, Hearst Bldg., San Francisco.

CEMENT MORTAR HARDENER
"Federal Steel Cement Hardener" manufactured by Federal Steel Cement Mills, Cleveland, represented by E. A. Bullis & Co. (See advertisement, page 26.)

COLD STORAGE PLANTS
Vulcan Iron Works, San Francisco.
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

CLOCKS—TOWER
Decker Electrical Construction Co., 111 New Montgomery St., San Francisco.

COMPOSITION FLOORING
Fibrestone & Roofing Co., 971 Howard St., San Francisco.

COMPRESSED AIR CLEANERS
The B. & W. Stationary Vacuum Cleaner, sold by Arthur T. Riggs, 510 Claus Spreckels Bldg., San Francisco.
Excello Stationary Vacuum Cleaner, F. W. Schaer Co., Pacific Coast Agts., Santa Maria Bldg., San Francisco.
Giant Stationary Suction Cleaner, San Francisco and Oakland.
Invincible Vacuum Cleaner, sold by R. W. Foyle, 149 New Montgomery St., San Francisco.
Tuec., mfrd. by United Electric Company, Coast Branch, General Contractors' Association, San Francisco.

CONCRETE CONSTRUCTION
American Concrete Co., Humboldt Bank Bldg., San Francisco.
Clinton Fireproofing Co., Mutual Bank Bldg., San Francisco.
McKibben & Taylor, 2125 Shattuck Ave., Berkeley.
Otto, W. H., 269 Park Ave., San Jose.
Foster, Vogt Co., Sharon Bldg., San Francisco.
P. A. Palmer, Monadnock Bldg., San Francisco.
Ransome Concrete Co., Oakland and Sacramento.
International Concrete Construction Company, West Berkeley, Cal.

CONCRETE HARDENERS
"Federal Steel Concrete Hardener," mfd. by Federal Steel Cement Mills, Cleveland, Ohio, sold by E. A. Bullis & Co. (See ad., p. 26.)

CONCRETE MACHINERY
Garfield Myers, factory representative of Insley Manufacturing Company, and Marsh-Capron Company, Hearst Bldg., San Francisco.

CONCRETE MIXERS
Austin Improved Cube Mixer. Factory branch. 473-485 Sixth St., San Francisco.
Foote Mixers sold by Edw. R. Bacon, 40 Natoma St., San Francisco.

CONCRETE PILES
McArthur Concrete Pile Company, Chronicle Building, San Francisco.

Underwriters' Labelled Fire Doors and Windows—Kalamein Interior Metal Doors and Trim — Metal Corner Bead — Metal Furniture, etc.

Capitol Sheet Metal Works INC.

Manufacturer of

SHEET METAL PRODUCTS

San Francisco Office and Factory, 1927-1935 MARKET STREET
Oakland Office and Factory, 117-119 FRANKLIN STREET

Telephone Sutter 4765

GASPARD & HAMMOND

BUILDING CONSTRUCTION

425 Sharon Building, 55 New Montgomery St. San Francisco, Cal.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONCRETE REINFORCEMENT

United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Clinton Welded Reinforcing System, L. A. Norris, 140 Townsend St., San Francisco.
"Kahn System," see advertisement on page 31, this issue.
International Fabric & Cable, represented by Western Builders' Supply Co., 155 New Montgomery St., San Francisco.
Triangle Mesh Fabric. Sales Agents, Pacific Building Materials Co., 523 Market St., San Francisco.
Twisted Bars, sold by Woods & Huddart, 444 Market St., San Francisco.

CONCRETE SURFACING

"Biturine," sold by Biturine Co. of America, 24 California St., San Francisco.
"Concreta" sold by W. P. Fuller & Co., San Francisco.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating, sold by R. N. Nason & Co., San Francisco and Los Angeles.
Glidden Liquid Cement, manufactured by Glidden Varnish Co., Whittier, Coburn Co., San Francisco.

CONTRACTORS, GENERAL

American Concrete Co., Humboldt Bank Bldg., San Francisco.
Arthur W. Biggers, 112 Market St., San Francisco.
Collman & Collman, 526 Sharon Bldg., San Francisco.
Construction & Engineering Co., Hobart Bldg., San Francisco.
M. Fisher, California-Pacific Bldg., San Francisco.
Foster, Vogt Co., Sharon Bldg., San Francisco.
Gaspard & Hammond, Sharon Bldg., San Francisco. (See card above.)
Howard S. Williams, Hearst Bldg., San Francisco.
Lange & Bergstrom, Sharon Bldg., San Francisco.
Lester Stock, 12 Geary St., San Francisco.
McLaren & Peterson, Sharon Bldg., San Francisco.
R. W. Moller, 185 Stevenson St., San Francisco.
John Monk, 216 Sharon Bldg., San Francisco.
Monson Bros., 1907 Bryant St., San Francisco.
Burt T. Owsley, 311 Sharon Bldg., San Francisco.
Ransome Concrete Co., Sacramento, Cal.
Western Building & Engineering Co., 455 Phelan Bldg., San Francisco.
Williams Bros. & Henderson, Holbrook Bldg., San Francisco.

CORK FLOORING

"Linotile," manufactured by Armstrong Cork & Insulation Company. M. C. Van Fleet, agt., 120 Jessie St., San Francisco.

CORNER BAR

Dolbear Curb Bar, manufactured by American Steel Bar Co., 1034 Merchants Exchange Bldg., San Francisco.

CORNER BEAD

Capitol Sheet Metal Works, 1827 Market St., San Francisco.
United States Metal Products Co., 525 Market St., San Francisco.; 750 Keller St., San Francisco.

CRUSHED ROCK

Grant Gravel Co., Flat Iron Bldg., San Francisco.
Niles Rock, sold by California Building Material Company, new Call Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.

DAMP-PROOFING COMPOUND

Biturine Co. of America, 24 California St., San Francisco.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.
Imperial Co., 183 Stevenson St., San Francisco.
"Impervite," sold by E. A. Bullis & Co. (See adv. on page 26.)
Trus-Con Damp Proofing. (See advertisement of Trussed Concrete Steel Company for Coast agencies.)
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
Wadsworth; Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS

McCabe Hanger Mfg. Co., New York, N. Y.
Pitcher Hanger, sold by National Lumber Co., Fifth and Bryant Sts., San Francisco.
Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.

DRINKING FOUNTAINS

Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
N. O. Nelson Mfg. Co., 978 Howard St., San Francisco.
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS

Spencer Elevator Company, 173 Beale St., San Francisco.
Burdett-Rowntree Mfg. Co., Underwood Bldg., San Francisco.

ELECTRICAL CONTRACTORS

Butte Engineering Co., 683 Howard St., San Francisco.
Central Electric Co., 185 Stevenson St., San Francisco.
Scott Co., Inc., 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

ELECTRICAL ENGINEERS

Chas. T. Phillips, Pacific Bldg., San Francisco.

MORTENSON CONSTRUCTION CO.

CONTRACTORS FOR STRUCTURAL STEEL AND IRON

H. MORTENSON, PRES. CHAS. G. MORTENSON, VICE-PRES. AND MGR.

OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS

PHONES: MISSION 5033—HOME M 3916 SAN FRANCISCO, CAL.

"FIBRESTONE"

SANITARY FLOORING, WAINSCOT AND BASE. Laid Exclusively by
FIBRESTONE & ROOFING CO., 971 Howard St. San Francisco Tel. Sutter 329

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.
San Francisco Elevator Co., 860 Folsom St., San Francisco.
Pacific Gurney Elevator Co., 186 Fifth St., San Francisco.
B. C. Van Emon Elevator Co., 235 First St., San Francisco.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co., Underwood Bldg., San Francisco

ELEVATOR ENCLOSURES
J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.

ENGINEERS
F. J. Amweg, 700 Marston Bldg., San Francisco.
W. W. Breite, Clunie Bldg., San Francisco.
L. M. Hausmann, Sharon Bldg., San Francisco.
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., Underwood Bldg., San Francisco.

FIRE EXIT DEVICES
Von Duprin Self-Releasing Fire Exit Devices, Vonnegut Hardware Co. (See Adv. for Coast Agencies.)

FIRE ESCAPES
Burnett Iron Works, Fresno, Cal.
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home J. 3435. 370-84 Tenth St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIRE BRICK
Livermore Fire Brick Co., Livermore. Cal.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces Colonial Fireplace Co., Chicago. (See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
Fink & Schindler, 218 13th St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.
T. H. Meek Co., 1157 Mission St., San Francisco.

FLAG POLES—TACKLE, ETC.
Pacific Foundry Company, Harrison and 18th Sts., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
Glidden Products, sold by Whittier-Coburn Co., San Francisco.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 971 Howard St., San Francisco.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

FURNACES
Cole Floor Furnace Company.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.

GARDEN FURNITURE
G. Tomagnini & Co., 219 Tenth St., San Francisco.
O. S. Sarsi, 123 Oak St., San Francisco.

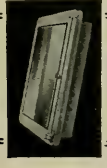
GAS GENERATORS
Utility Gas Generator Co., 340 Sansome St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier-Coburn Co., Howard & Beale Sts., San Francisco.

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
Raymond Granite Co., Division and Potrero Sts., San Francisco.

GRAVEL, SAND AND CRUSHED ROCK
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.

GRAVITY CHUTES
Gravity Spiral Chutes, sold by G. E. Sturgis' Supply House, 602 Mission St., San Francisco.



"White-Steel" Medicine Cabinets and Mirrors are the last word in Sanitary Bathroom Equipment. See Sweet's 1914 Catalog, Pages 1054-1055 or write for full information.

"WHITE-STEEL" SANITARY FURNITURE CO.
Grand Rapids, Michigan

Northern California
Johnson-Locke Mercantile Co.
San Francisco, Calif.

Southern California
H. R. Boynton Company
Los Angeles, Calif.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
American Keene Cement Co., 333 Monadnock Bldg., San Francisco.
"Empire" Hardwall Plaster, Pacific Portland Cement Company, Pacific Bldg., San Francisco.

HARDWARE
Russwin Hardware, Joost Bros., San Francisco.
Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, Los Angeles and San Diego.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.
Western Brass Mfg. Co., 217 Tehama St., S. F.
Russell & Erwin Manufacturing Co., Commercial Bldg., San Francisco.

HARDWOOD FLOORING
Parrott & Co., 320 California St., San Francisco
White Bros., Cor. Fifth and Brannan Sts., San Francisco.
Hardwood Interior Co., 554 Bryant St., San Francisco.

HARDWOOD LUMBER
Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
Parrott & Co., 320 California St., San Francisco.
White Bros., Cor. Fifth and Brannan Sts., San Francisco.

HEATERS—AUTOMATIC
Pittsburg Water Heater Co., 237 Powell St., San Francisco.
Hoffman Heaters, factory branch, 397 Sutter St., San Francisco.

HEATING AND VENTILATING
American Heat & Power Co., Oakland, Cal.
J. M. Boscus, 975 Howard St., San Francisco.
Fess System Co., 220 Natoma St., San Francisco.
Mangrum & Otter, Inc., 507 Mission St., San Francisco.
Charles T. Phillips, Pacific Building, San Francisco.
Scott Company, 243 Minna St., San Francisco.
Wittman, Lyman & Co., 341 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
Petersen-James Co., 730 Larkin St., San Francisco.

HOLLOW BLOCKS
Denison Hollow Interlocking Blocks, 310 Ochsner Bldg., Sacramento, and Chamber of Commerce Bldg., Portland.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

IRONING BOARDS
Merritt Patent Ironing Board, sold by A. Hommel, agent, Atlanta Hotel, San Francisco.

JOIST HANGERS
Western Builders' Supply Co., 155 New Montgomery St., San Francisco.

KEENE CEMENT
American Keene Cement Co., Monadnock Bldg., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 9 Main St., San Francisco.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Sunset Lumber Co., Oakland, Cal.
Santa Fe Lumber Co., Seventeenth and De Haro Sts., San Francisco.
E. K. Wood Lumber Company, East Oakland, California.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (See Adv. on page 38 for Coast representatives.)

MANTELS
Mangrum & Otter, 561 Mission St., San Francisco.

MARBLE
G. Tomagnini & Co., 219 Tenth St., San Francisco.

MEDICINE CABINETS
White Steel Sanitary Furniture Co., rep. by Johnson-Locke Mercantile Co., San Francisco.

METAL AND STEEL LATH
"Steelcrete" Expanded Metal Lath, sold by Holloway Expanded Metal Company, Monadnock Bldg., San Francisco.
L. A. Norris & Co., 140 Townsend St., San Francisco.

METAL CEILINGS
San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
U. S. Metal Products Co., 525 Market St., San Francisco.
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., San Francisco.
Capitol Sheet Metal Works, 1927 Market St., San Francisco; 117 Franklin St., Oakland.

METAL FURNITURE
M. G. West Co., 353 Market St., San Francisco.
Chas. M. Finch, 311 Board of Trade Bldg., San Francisco.
Capitol Sheet Metal Works, San Francisco and Oakland.

METAL SHINGLES
Meurer Bros., 630 Third St., San Francisco.
San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

MORTAR COLORS
Dry Mineral Dyes, sold by E. A. Bullis & Co. (See adv., page 26.)

OIL BURNERS
American Standard Oil Burner Co., Seventh and Cedar Sts., Oakland.
S. T. Johnson Co. (see adv. below).
Fess System Co., 220 Natoma St., San Francisco.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE
American Art Metal Works, 13 Grace St., San Francisco.
Brode Iron Works, 31-37 Hawthorne St., San Francisco.
Burnett Iron Works, Fresno.
Palm Iron & Bridge Works, Sacramento.
California Artistic Metal & Wire Co., 349 Seventh St., San Francisco.
J. G. Braun, Chicago and New York.
Ralston Iron Works, 20th and Indiana Sts., San Francisco.
Monarch Iron Works, 1165 Howard St., San Francisco.
C. J. Hilliard Company, Inc., 19th and Minnesota Sts., San Francisco.
Shreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.
Vulcan Iron Works, San Francisco.

PAINTING AND DECORATING
D. Zelinsky, 564 Eddy St., San Francisco.
Robert Swan, 1133 E. 12th St., Oakland.

PAINT FOR BRIDGES
Biturine Company of America, 24 California St., San Francisco.

PAINT FOR CEMENT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.). (See Adv. in this issue for Pacific Coast agents.)
"Biturine," sold by Buturine Co. of America, 24 California St., San Francisco.
Trus-Con Stone Tex., Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
Concreto Cement Coating, manufactured by the Muralo Company, 540 Valencia St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
"Technola," a cement paint, sold by C. Roman, San Francisco.

PAINT FOR STEEL STRUCTURES
"Biturine," sold by Biturine Co. of America, 24 California St., San Francisco.
Carbonizing Coating. Made by Goheen Mfg. Co., Canton, Ohio. C. W. Coburn & Co., 320 Market St., San Francisco, and A. J. Capron, Ainsworth Bldg., Portland, Agents.
Trus-Con Bar-Ox, Trussed Concrete Steel Co. (See Adv. for Coast agencies.)

PAINTS, OILS, ETC.
Bass-Heuter Paint Co., Mission, near Fourth St., San Francisco.
Whittier-Coburn Co., Howard and Beale Sts., San Francisco.
W. P. Fuller & Co., all principal Coast cities.
"Biturine," sold by Biturine Co. of America, 24 California St., San Francisco.
Standard Varnish Works, 113 Front St., San Francisco.

PAINTS, OILS, ETC.—Continued.

PAVING BRICK
California Brick Company, Phelan Bldg., San Francisco.

PHOTO ENGRAVING
California Photo Engraving Co., 121 Second St., San Francisco.

PHOTOGRAPHY
R. J. Waters Co., 717 Market St., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Pacific Sewer Pipe Co., I. W. Hellman Bldg., Los Angeles.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PLASTER CONTRACTORS
A. Knowles, 985 Folsom St., San Francisco.
C. C. Morebouse, Crocker Bldg., San Francisco.
J. J. Connolly & Son, Builders' Exchange, San Francisco.

PLUMBERS' MARBLE HARDWARE
Western Brass Mfg. Co., 217 Tehama St., S. F.

PLUMBING
Boscus Bros., 975 Howard St., San Francisco.
Scott Co., Inc., 243 Minna St., San Francisco.
Petersen-James Co., 730 Larkin St., San Francisco.
Wittman, Lyman & Co., 341 Minna St., San Francisco.
Alex Coleman, 706 Ellis St., San Francisco

PLUMBING FIXTURES, MATERIALS, ETC.
Crane Co., Second and Brannan Sts., San Francisco.
N. O. Nelson Mfg. Co., 978 Howard St., San Francisco.
California Steam Plumbing Supply Co., 671 Fifth St., San Francisco.
Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
Western States Porcelain Co., San Pablo, Cal.

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., San Francisco.

PUMPS
Chicago Pump Company, 612 Howard street, San Francisco.

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

REFRIGERATORS
- McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.
- Vulcan Iron Works, San Francisco.

REVERSIBLE WINDOWS
- Hauser Reversible Window Company, Balboa Bldg., San Francisco.

REVOLVING DOORS
- Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROCK BREAKING MACHINERY
- Vulcan Iron Works, Francisco and Kearny Sts., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
- Pacific Building Materials Co., 523 Market St., San Francisco .
- C. F. Weber & Co., 365 Market St., San Francisco.
- Kinnear Steel Rolling Doors, W. W. Thurston, agent, Rialto Bldg., San Francisco.
- Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles.

ROOFING AND ROOFING MATERIALS
- Biturine Co. of America, 24 California St., San Francisco.
- Grant Gravel Co., Flat Iron Bldg., San Francisco.
- Fibrestone & Roofing Co., 971 Howard St., San Francisco.
- National Roofing Company, Plaza Bldg., Oakland.
- "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
- Mackenzie Roof Co., 425 15th St., Oakland.
- United Materials Co., Crossley Bldg., San Francisco.

ROOFING TIN
- Meurer Bros., A. H. MacDonald, agent, 630 Third St., San Francisco.

SAFES, VAULTS, BANK EQUIPMENT
- M. G. West Co., 353 Market St., San Francisco.

SANITARY DRINKING FOUNTAINS
- N. O. Nelson Mfg. Co., 978 Howard St., San Francisco.
- Haws' Sanitary Drinking Faucet Co., 1808 Harmon St., Berkeley.

SANITARY BATH FIXTURE
- "Boudoir" bath tub, mfrd. by Improved Sanitary Fixture Co., 411 S. Los Angeles St., Los Angeles. Sold by all plumbing houses.

SANITARY KITCHEN SINK
- Improved Sanitary Fixture Company, 411 S. Los Angeles St., Los Angeles.

SASH CORD
- Regal Sash Cord, Louisville Selling Co. represented on Pacific Coast by Baker & Hamilton.
- Samson Cordage Works, manufacturers of Solid Braided Cords and Cotton Twines, 88 Broad St., Boston, Mass.

SCENIC PAINTING—DROP CURTAINS, ETC.
- The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles

SCHOOL FURNITURE AND SUPPLIES
- C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.
- A. H. Andrews & Co., 728 Mission St., San Francisco.

SEWAGE EJECTORS
- Chicago Pump Co., represented by Telephone Electric Equipment Co., 612 Howard street, San Francisco.

SHEATHING AND SOUND DEADENING
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

SHEET METAL WORK, SKYLIGHTS, ETC.
- Capitol Sheet Metal Works, 1927 Market St., San Francisco.
- U. S. Metal Products Co., 525 Market St., San Francisco.

SHINGLE STAINS
- Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.

STEEL AND IRON—STRUCTURAL
- Burnett Iron Works, Fresno, Cal.
- Central Iron Works, 621 Florida St., San Francisco.
- Dyer Bros., 17th and Kansas Sts., San Francisco.
- Brode Iron Works, 31 Hawthorne St., San Francisco.
- Judson Manufacturing Co., 819 Folsom St., San Francisco.
- Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
- J. L. Mott Iron Works, D. H. Gulick, agents, 135 Kearny St., San Francisco.
- Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
- Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J. 3435, 370-84 Tenth St., San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
- U. S. Steel Products Co., Rialto Bldg., San Francisco.
- Schreiber & Sons Co., represented by Western Builders Supply Co., S. F.
- Vulcan Iron Works, San Francisco.
- Western Iron Works, 141 Beale St., San Francisco.
- Woods & Huddart, 444 Market St., San Francisco.

STEEL PRESERVATIVES
- Biturine Company of America, 24 California St., San Francisco.
- Wadsworth, Howland & Co., Boston Mass. (See Adv. for Coast agencies.)

STEEL BARS FOR CONCRETE
- Kahn and Rib Bars, made by Trussed Concrete Steel Co. (See Adv. for Coast agencies.)
- Woods & Huddart, 444 Market St., San Francisco.

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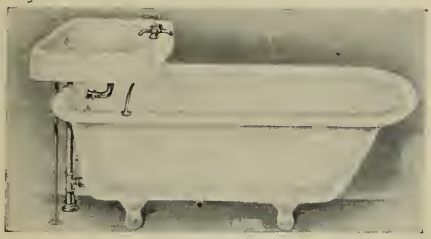

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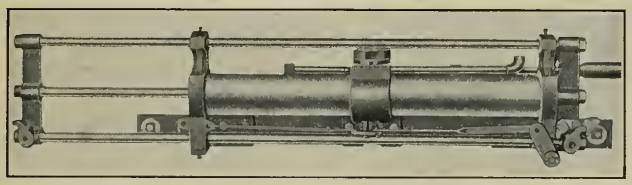

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STEEL MOULDINGS FOR STORE FRONTS
J. G. Braun, 615-621 S. Paulina St., Chicago, Ill.

STEEL FIREPROOF WINDOWS
United States Metal Products Co., San Francisco and Los Angeles.

STEEL STUDDING
Collins Steel Partition, Parrott & Co., San Francisco and Los Angeles.

STEEL ROLLING DOORS
Kinnear Steel Rolling Door Co., W. W. Thurston, Rialto Bldg., San Francisco.

STEEL WHEELBARROWS
Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

STONE
California Granite Co., 518 Sharon Bldg., San Francisco.
Boise Sandstone Co., Boise, Idaho.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.
Colusa Sandstone Co., Potrero Ave. and Division St., San Francisco.

STORAGE SYSTEMS
S. F. Bowser & Co., 612 Howard St., San Francisco.

SURETY BONDS
Globe Indemnity Co., Insurance Exchange Bldg., San Francisco.
J. B. Nabors & Sons, Kohl Bldg., San Francisco.
Fidelity & Deposit Co. of Maryland, Mills Bldg., San Francisco.
Pacific Coast Casualty Co., Merchants' Exchange Bldg., San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market St., San Francisco.

TELEPHONE EQUIPMENT
Telephone Electric Equipment Co., 612 Howard St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
California Tile Contracting Company, 206 Sheldon Bldg., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.

TILE FOR ROOFING
Fibrestone & Roofing Co., 971 Howard St., San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
Denison Hollow Interlocking Blocks, Ochsner Bldg., Sacramento.

TIN PLATES
American Tin Plate Co., Riato Bldg., San Francisco.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
Western States Porcelain Co., Richmond, Cal.

VACUUM CLEANERS
Giant Stationary Suction Cleaner, manufactured by Giant Suction Cleaner Co., 731 Folsom St., San Francisco and Third and Jefferson Sts., Oakland.
Invincible Vacuum Cleaner, R. W. Foyle, Agent, San Francisco.
"Excello" Stationary Vacuum Cleaner, F. W. Schaer Bros., Pacific Coast agents, Santa Maria Bldg., San Francisco.
"Tuec" Air Cleaner, manufactured by United Electric Co., 110 Jessie St., San Francisco.
B. & W. Stationary Vacuum Cleaner, sold by Arthur T. Riggs, 510 Claus Spreckels Bldg., San Francisco.

VALVES
Jenkins Bros., 247 Mission St., San Francisco.

VALVE PACKING
"Palmetto Twist," sold by H. N. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
W. P. Fuller Co., all principal Coast cities.
Glidden Varnish Co., Cleveland, O., represented on the Pacific Coast by Whittier-Coburn Co., San Francisco.
Standard Varnish Works, 113 Front St., San Francisco.
S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.
Moller & Schumann Co., Hilo Varnishes, 1022-24 Mission St., San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.

VENETIAN BLINDS, AWNINGS, ETC.
C. F. Weber & Co., 365 Market St., San Francisco.

WATER HEATERS—AUTOMATIC
Pittsburg Water Heater Co. of California, 237 Powell St., San Francisco, and Thirteenth and Clay Sts., Oakland.

WALL BEDS
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

WALL BOARD
Bishopric Wall Board sold by I. E. Thayer & Co., San Francisco, and Central Door & Lumber Co., Portland, Oregon.

WALL SAFES
Lowrie Wall Safe, sold by C. Roman Co., 173 Jessie St., San Francisco.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
"Impervite," sold by E. A. Bullis & Co. (See adv. on page 26.)
Concreto Cement Coating, manufactured by the Muralo Co. (See page 124.)
Fibrestone & Roofing Co., 971 Howard St., San Francisco.
Imperial Co., 183 Stevenson St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Wadsworth, Howland & Co., Inc. (See Adv. for Coast agencies.)

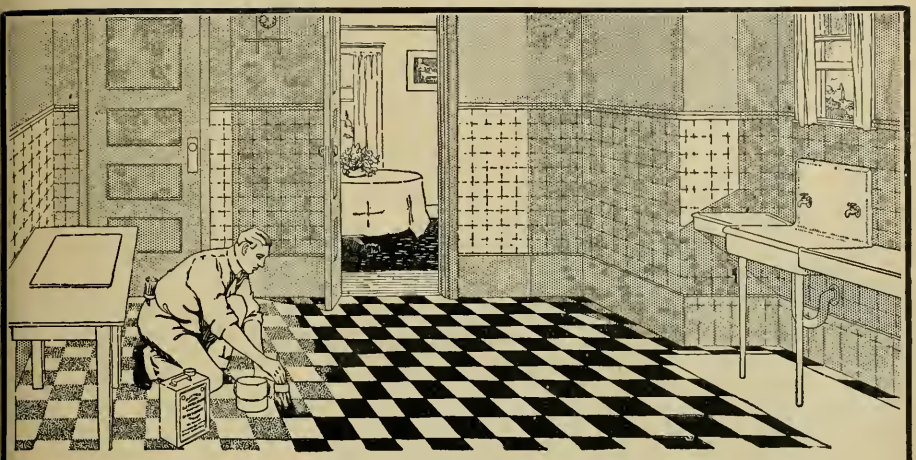
WHITE ENAMEL FINISH
"Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
"Satinette," Standard Varnish Works, 113 Front St., San Francisco.
Trus-Con Sno-wite, manufactured by Trussed Concrete Steel Co. (See Adv. for Coast distributors.

WINDOWS—REVERSIBLE, ETC.
Perfection Reversible Window Co., 2025 Market St., San Francisco.
Whitney Adjustable Window Co., San Francisco. (See page 25.)
Hauser Reversible Window Co., Balboa Bldg., San Francisco.

WINDOW SHADES
Top Light Shade Co., 737 Market St., Oakland.

WIRE FABRIC
U. S. Steel Products Co., Rialto Bldg., San Francisco.
L. A. Norris Co., 140 Townsend St., San Francisco.

WOOD MANTELS
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.



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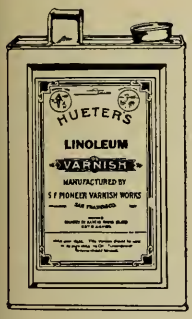
This is something more than a varnish. It is made to dry quickly—over night—and have a durable elastic finish. It is a pale shade and will not change the color of the linoleum; simply clean the floor with soap and water and it will always look spick and span.



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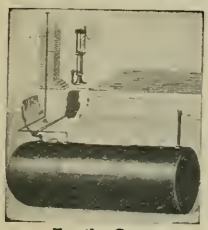

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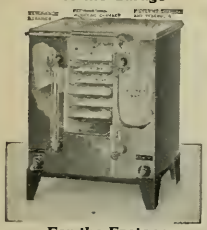

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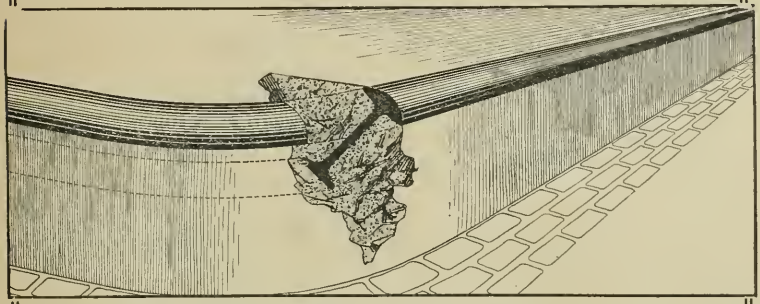

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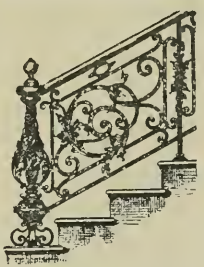

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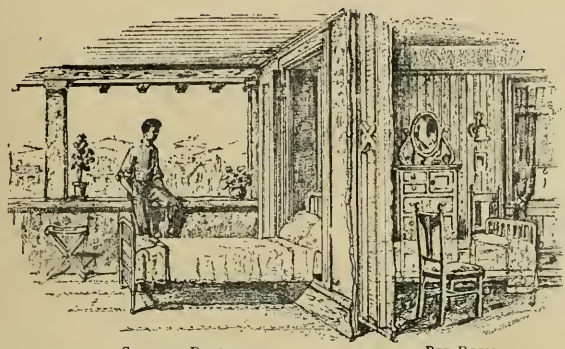

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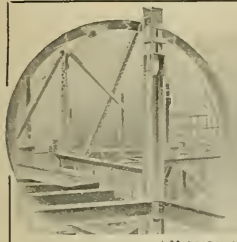

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Frontispiece
The Architect and Engineer
of California
for March, 1915

MAIN ENTRANCE, OAKLAND TECHNICAL HIGH SCHOOL, OAKLAND, CALIFORNIA
JOHN J. DONOVAN, ARCHITECT, AND HENRY HORNBOSTEL, CONSULTING ARCHITECT

THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XL. MARCH, 1915 No. 3.

ENTRANCE, LOCKWOOD SCHOOL, OAKLAND
John J. Donovan and Lewis P. Hobart, Associate Architects

Recent School Buildings in Oakland

By B. J. S. CAHILL, A. I. A.

CITIES are like people. Each has characteristics of its own. And like human beings, cities are not without their foibles and failings, their virtues and their points of excellence. One of the common weaknesses of human nature is to take particular pride in some accomplishment in which after all we are not as strong as we would like to be. And just as often we are prone to overlook good points easily conceded by everybody but ourselves. We architects, for instance, are all familiar with the man who is a born artist but who takes particular pride in proving that, really, he is a keen business man before everything. And we know the hard-headed constructionist who poses as a judge of paintings.

Chicago and Pittsburg, knowing their strength in pork and pig iron seem ashamed of it and would infinitely rather be remembered by their art institutes and symphony societies than famed for their stock yards or foundries.

San Francisco is known all over the world as a rather naughty, free and easy sort of place. That is why all the world delights to show a friendly affection for us by calling the town "Frisco." But we who live here and make the city, show the utmost horror for this sporty and familiar nickname. We insist on the solemn and saintly "San Francisco." For a people who are in the habit of calling their mayor and president "Jim" and "Teddy," this pernickerty objection to "Frisco" has always seemed to me a foible, a human one to be sure, but a foible just the same.

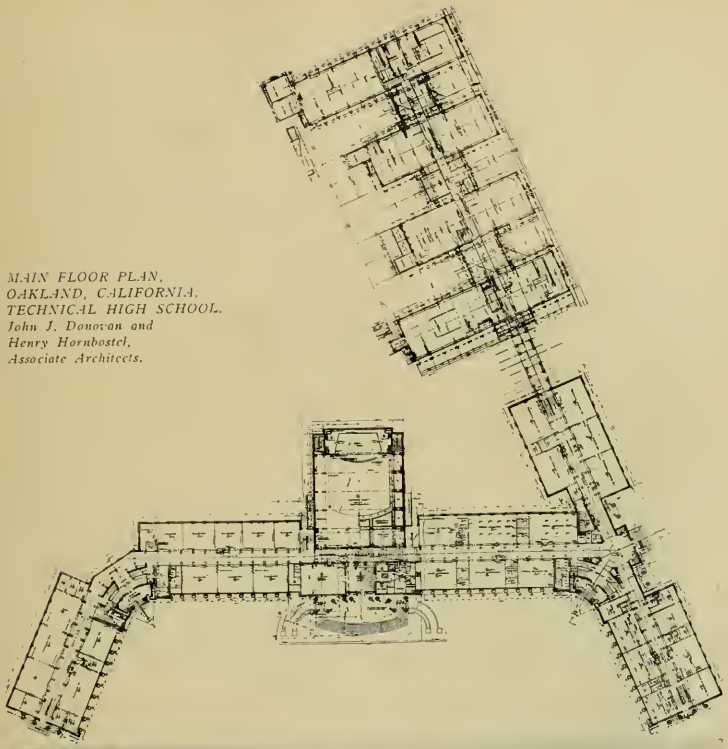
Now, the main foible of the city of Oakland, if we may endow that city with human qualities, seems to be in her desire to be known as a self-sufficing metropolis. There may be something of destiny in these aspirations, but a rather overloaded insistence on them does not impress the stranger. On the other hand, Oakland has achieved a success and a distinction on other lines that have never been sufficiently emphasized. No city in the West in comparison with its population has spent so much time, thought and money on its public school system and school buildings.

Nearly a generation ago Oakland built the then finest high school on the coast; and in the writer's memory one wave of school building activity has succeeded another, each involving more money, more enterprise and more applied ingenuity than the last, until, it is safe to say, Oakland stands better served in this respect, perhaps, than any city in the country.

The present moment sees the culmination of this activity in the realization of over twenty new school buildings projected on the bond issue of 1911, in which nearly three million dollars was voted for this great undertaking. The whole of this work was put into the hands of Architect John J. Donovan, who may be said to have epitomized the dynamic intent of the school department and to have infused the necessary unity of will and purpose into the various joint enterprises in which other distinguished architects were invited to collaborate. The remarkable results of these successive enterprises in which Mr. Donovan led with progressive partners is shown pictorially in a series of photographs here following.

Any one familiar with the old style gaunt school house will see at a glance that here we have something most decidedly different. And let us add quickly that mere difference is in itself no merit. If a thing is well done, to do it differently may be merely to do it indifferently. The only valid excuse for change should, of course, be change for the better. It will not take long to come to a decided conclusion on this score.

The most remarkable characteristic of the aggregate work here shown as distinguished from the school architecture of an earlier epoch, consists undoubtedly in the honest use of good material in simple and suitable forms rather than in using cheap material in pretentious and pompous make-believe. And in this one particular we are inclined to think the new school houses are abundantly justified. The object of the common school in this or any land is to train children to grow into worthy men and women and good citizens. The impression of the school house on young and tender minds may reasonably be assumed as the very first impressions of an abiding character made on children when they leave the home and nursery. It is the first impression of the great outer world. Next to the home itself no other influence will ever be so permanent. Whatever else we forget in after life, we remember our school and our school days. One cannot but feel that an enormous sub-conscious influence must be exerted on the whole of one's life by the impressions conveyed from the school house. The child that passes daily along dark and dirty corridors, or who plays on rickety wooden steps, who sees dilapidated orders imitated in mill work or sheet metal, who sees nothing true and genuine during school hours, must be affected unfavorably for all his years to come. The boy or girl, on the other hand, who treads steps of granite or brick, whose eye rests on real stonework and real red tiles rather than painted tin ones, who learns to associate the charm of a beautifully designed school court with the honesty and sincerity of natural and simple materials—such a boy or girl must inevitably grow up with more wholesome and worthy ideals than could be possible from association with painted, mill-made shams of the old style wooden schools of the cheap and trivial attempts at near-classic, so often done without a trace of sympathy, honesty or sense.



MAIN FLOOR PLAN,
OAKLAND, CALIFORNIA,
TECHNICAL HIGH SCHOOL.
John J. Donovon and
Henry Hornbostel,
Associate Architects.

OAKLAND TECHNICAL HIGH SCHOOL, OAKLAND, CALIFORNIA.

Especial stress is laid on the use of good material well and substantially put together from designs that have quality and intelligence. There is need in this age of early association with whatever is sound and abiding rather than with things that are cheap and transitory. It is a national need of the hour and cheap at any price we can pay for it.

* * *

Problems That Have Been Solved in Oakland's New School Buildings

By JOHN J. DONOVAN, Architect.

ON May 16, 1911, the City of Oakland voted $2,593,900 in bonds for the erection of new school buildings at various points throughout the city.

On February 12, 1912, the writer was appointed architect for the City of Oakland, having a contract with the city to perform all architectural services in connection with the construction of new buildings.

Due to the loss of time between the date of the election and the appointment, and the important need of the completed buildings on account of the crowded conditions of the old buildings, the Commissioner of Public Works, Mr. Harry S. Anderson, and myself deemed it advisable that other architects be invited to associate with me in order that the preliminary work might be expedited and the buildings made ready and relieve the congestion. In view of this the writer invited several architects to associate with him, and it is my great pleasure at this time to give full credit to all the gentlemen connected with me in the work.

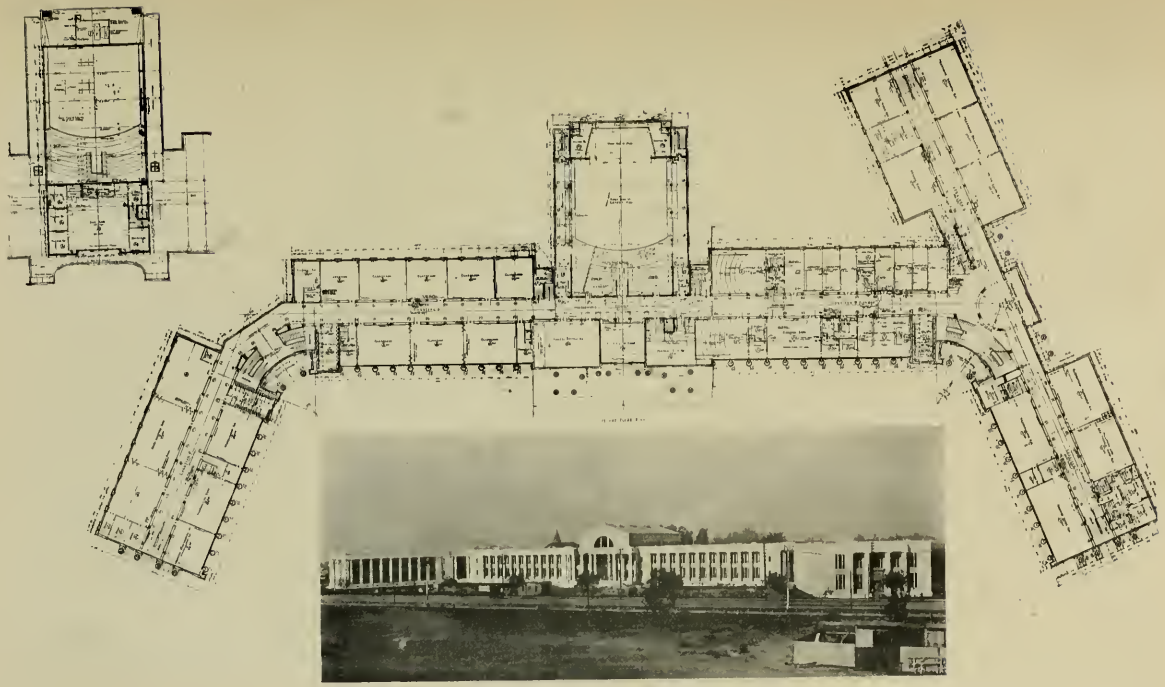
From February 12, 1912, extending through some months, a very exhaustive preliminary study was made by an advisory committee appointed by the Board of Education. This body was composed of the leading men and women in educational work not only on the Pacific Coast but elsewhere. This committee, in conjunction with the writer, compiled and segregated data and put it in a workable form. Upon the completion of the buildings it is remarkable that the data has been followed almost implicitly, and the results show the advisability of the appointment of this commission.

The uppermost thought during the preliminary work was to achieve with the funds available pleasing types of school buildings, buildings which would be inviting to the pupils and free from any of the prison-like effects which characterize many of our old school buildings, and at the same time meet the school requirements in all matters and details. Furthermore, we strove to have the buildings fit the lots.

Particular care and attention was given to the orientation of the class rooms, placing them so that sunshine entered these rooms at some time of the day. The favorable points of the compass in this locality are the east, west and south, respectively, and in that order.

The playground with relation to the school building was carefully considered and unless there was a very large area of school playground the building was placed so that very little shade fell upon the playground. This meant that our buildings would have, as nearly as we could arrange it, a southern exposure for the playgrounds.

It will be noted that many of the buildings shown in the illustrations are one story in height, a new type for this part of the country, and a type which, unfortunately, has been adopted by many sections of the State without much consideration. In the first place the one-story type of school was the result of a clamor on the part of many people momentarily active in school work who knew little or nothing about the subject; mostly nothing, and their influence was such as to predominate the thought in many instances, thereby having an in-



SECOND FLOOR PLAN AND VIEW FROM THE NORTHEAST OAKLAND TECHNICAL HIGH SCHOOL, OAKLAND, CALIFORNIA JOHN J. DONOVAN, ARCHITECT, AND HENRY HORNBOSTEL, CONSULTING ARCHITECT

MAIN ENTRANCE, EMERSON SCHOOL, OAKLAND, CALIFORNIA
JOHN J. DONOVAN and JOHN GALEN HOWARD, ASSOCIATE ARCHITECTS

PRINCIPAL'S OFFICE, EMERSON SCHOOL, OAKLAND
John J. Donovan and John Galen Howard, Associate Architects

MANUAL TRAINING ROOM, EMERSON SCHOOL, OAKLAND

PATIO, EMERSON SCHOOL, OAKLAND
John J. Donovan and John Galen Howard, Associate Architects

PATIO, SHOWING OPENNESS OF CLASS ROOMS, EMERSON SCHOOL, OAKLAND

fluence on the design and arrangements and, of course, responsible for certain conditions resulting therefrom.

In writing frankly I believe that those who read this article can be benefited by the experiences gained, and I am only too pleased to impart the results of these experiences in order that the mistakes of the past may be minimized in the work of the future.

Regardless of what strides we may have made I know that the millenium in this work has not been reached and that there is room for improvement and enlargement, better conditions, better buildings, better mentalities for the school children, teachers and boards, and, last but not least, for the architects who have the work to perform.

In brief, the one-story school building is a success where there is plenty of land available and ample provisions can be made for protected playroom space, so that children may play under cover during inclement weather and play with comfort. The one-story building prohibits this unless girls' and boys' playrooms are incorporated in the design as separate buildings, connected, of course, to the school. Substitutes for these are the assembly halls and corridors, all of which are not advisable. This also applies to two-story buildings as well, unless a scheme is adopted such as is illustrated in the Oak Park School at Sacramento. This feature is mentioned further on.

A requirement demanded by the citizens and which has proven to be a remarkable success is the semi-open-air classroom. This problem has been solved and solved in such a way as to enable the classroom to be closed during inclement weather. During favorable weather one side of the room may be almost entirely open. This has been accomplished by the use of a window which revolves in a horizontal plane to an angle of more than ninety degrees. With shades on the underside of the sash and the sash open at an angle of about thirty degrees direct sunshine is excluded. Usually there are three sashes in each frame, directly over each other, and the opening of the three sashes, with the shades attached thereto, excludes the direct sunshine and at the same time furnishes sufficient open areas for fresh air. Coupled with these are transome placed near the ceiling, on the opposite side of the room, opening into the corridors or arcades, thereby affording means of obtaining good, natural ventilation.

To the city officials belongs the credit of engaging a heating and ventilating expert, also an electrical engineer, who worked under the directions of the architect, and in consequence of this the schools of the City of Oakland are splendidly equipped in these two branches of their construction.

The heating system installed is the direct and indirect; that is, a series of radiators placed near the windows, supplying sufficient heat to warm the rooms during late fall and early spring and many days in the winter. The plenum system, which has been installed in every school building, furnishes tempered fresh air in conjunction with the radiators during very cold, dismal days. On these days it is necessary, in order to have the system work as perfectly as possible, for the windows and transoms to be closed. The air furnished by the fans is drawn from the roof and from certain elevations above the ground, high enough to eliminate the suction of dust. In many instances air washers have been installed, so that when the windows are closed we feel quite assured that clean, fresh air is forced into the classrooms, and the hygienic and healthful condition of the children in the new schools show a marked improvement over the old. In many of the old schools wretched conditions prevailed, not only in the plumbing, but in the heating and ventilating arrangements. Apparently no attempt was made to provide proper locations for fresh air intakes and poor methods were provided for the handling of this air after it was drawn in by the fans. The writer remembers one particularly striking instance of visiting a

ANOTHER VIEW OF PATIO, EMERSON SCHOOL, OAKLAND

school of the old type (not so very old in years) in company with the department doctor and three other officials, and finding that over thirty-three per cent of the children in the classroom were affected by throat or nasal trouble and that many had been absent from school during two of the winter months previous to the time of our visit. The teacher informed us that that was a common condition throughout the winter months of the year, indicating fully that the hot air furnace left its mark wherever it was installed. This statement was confirmed by six of the other teachers in this particular school.

Briefly stated, the other equipments, such as lighting, plumbing and blackboards have been studied with much care and consideration.

The lighting and illuminating engineering for evening courses was repeatedly tested for proper location of lamps in the class rooms, and examination will show that the outlets were placed without regard for symmetry with the axes of the room. The outlets nearest the teachers' desks have been located so that a pupil in the rear seat may read the writing on the blackboard back of the teacher's desk without the rays of the light directly entering the eye. Furthermore, the outlets have been placed so that as much light as possible is to the left of the pupil. Of course, this is impossible to accomplish with the seats nearest the windows, but generally the illumination on the desk is such as to eliminate a left hand shade. Direct lighting, with frosted globes, has been used throughout.

A word on the plumbing may not be amiss in that this has been the least considered subject in most of the previous work, although it is one of great importance. The old latrine for watercloset and urinal uses has been aban-

FRONT VIEW OF McCHESNEY SCHOOL, OAKLAND
John J. Donovan, Architect

REAR VIEW OF McCHESNEY SCHOOL, OAKLAND
John J. Donovan, Architect

AUDITORIUM, McCHESNEY SCHOOL, OAKLAND

TERRACE, McCHESNEY SCHOOL, OAKLAND
John J. Donovan, Architect

doned and in its place are the individual vitreous china waterclosets and urinals, both ventilated into the utility chamber. The toilet rooms are ventilated through the fixtures into this utility chamber, which is connected by ducts to an exhaust fan, exhausing the foul air above the roof.

All toilet rooms are placed so as to obtain as much sunshine as possible. These rooms are supplied with air from the open windows. Inasmuch as the vents through the fixtures are near the floor level there is no cause for foul air passing the faces of the pupils. The system and method has proven very satisfactory and quite sanitary.

We have made it a point to install slate blackboards wherever our funds would permit it, and nearly ninety per cent of the schools are thus equipped. The cost is about thirty-three to thirty-five cents per square foot, against twelve to fifteen cents per square foot for imitation, but the advantages gained are several hundred per cent over the use of the imitation slate. I cannot state too strongly that the use of imitation or composition blackboards is a detriment to good and graceful handwriting. It is a pleasure for a child to write on a slate blackboard, while it is a laborious task to write on imitation. In the first place, chalk moves over slate without much friction, while on the other hand the chalk is retarded and the labor is great when there is much writing. Therefore, I heartily recommend to all concerned the slate blackboard.

The interior painting and coloring has been kept simple and cheerful, using soft, light tints on the walls and ceilings, mostly buff in color for the walls, and for the ceilings a flat, white egg-shell tone.

Inasmuch as the photographs tell most of the story a few of the buildings will be described but briefly.

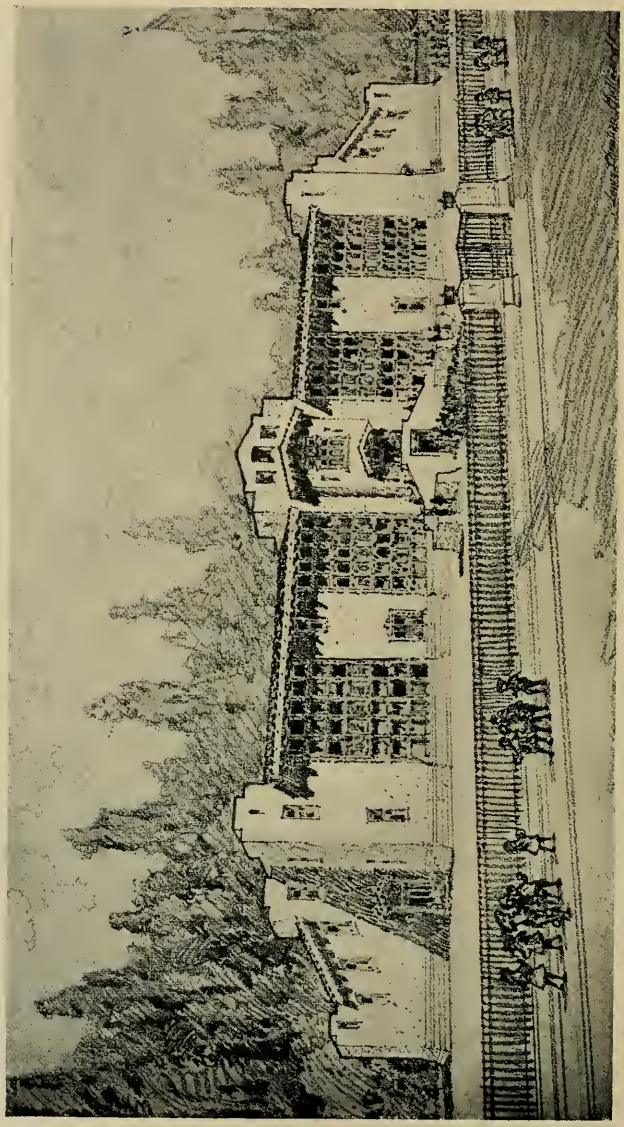
The Oak Park school at Sacramento is a twenty-three classroom building, containing an assembly hall, with a seating capacity of eleven hundred, a branch library and reading room, kindergarten, with an open hedge terrace, boys' and girls' shower and toilet rooms, laboratory, wood-working room, and on the north at the second floor are boys' and girls' open playrooms. The floors of these latter rooms are waterproofed to protect the classrooms below. In observing the plan it is notable that all classrooms face east and north, the majority on the east. This was a requirement of the Board of Education of Sacramento, due to the intense heat of that section during the summer.

There are play-yards for the older boys and girls on the east and west, sufficiently large to permit games of baseball and basketball, and interior playgrounds for the smaller boys and girls.

Between the arcade connecting the assembly hall and the library and the center pavilion are experimental gardens, which serve a very good purpose in the study of horticulture and agriculture, subjects which are taught extensively in the interior towns and cities.

The structure is of reinforced concrete, trimmed with red tapestry brick with spots of color produced by terra cotta tile. It is crowned with a red Mission tile roof. This school represents an investment of $225,000.00.

The Oakland Technical High School, or what was originally known as the Manual Training and Commercial High School, consists of a group of buildings. The southeast pavilion is devoted to commercial work, such as bookkeeping, stenography, etc. The pavilion south of the assembly hall is devoted to class-rooms for the academic studies. The first pavilion north of the assembly hall and connected thereto is the Science Department. The northeast pavilion is assigned to Home Economics, and the northwest pavilion in the first group contains the drafting rooms for mechanical, architectural and free-hand drawing.



DURANT SCHOOL, OAKLAND, CALIFORNIA
JOHN J. DONOVAN and LOUIS C. MULLGARDT } ASSOCIATE ARCHITECTS

The group of four buildings to the west of this latter group and connected by an arcade includes the eight shops. They are, in order, the machine shop, forge shop, foundry, electrical shop, carpenter shop, plumbing and metal shop, cabinet and pattern shop, and are complete in every detail and equipped with the most modern machinery. It is intended that these shop buildings shall have a wider use than day school instruction. The Board of Education at the present time is preparing a curriculum for evening instruction to the apprentices of the various trades. The unlimited possibilities of the uses of these buildings crowd each other out of place. For instance, besides instruction on mechanical work the probability is that the student-apprentice will have many opportunities to satisfy any desires for advancement into the theories, physics and chemistry of his work.

The plot plan shows the campus to the west of the group, with the gymnasium on the side.

The building just completed is most splendidly equipped. The arrangements are such that the various departments are free from confusion during the arrival and departure to and from the class rooms. Numerous stairways have been placed to assist in this freedom from congestion.

These buildings are of reinforced concrete, trimmed with polychrome terra cotta, and the effect is stupendous in viewing the building from the east, with its facade over eight hundred feet long, screened with engaged columns; and, at the same time, these columns obstruct no light from the classrooms. A notable result is attained from the reflected light emitted from that surface of the columns presumably in shade.

The exterior plastered surfaces have been painted with a concrete paint of a soft, warm tone, which, together with the polychrome terra cotta has created an effect which is simple and interesting.

I wish to give credit to Mr. Henry Hornsbostel, of New York, for his work on this building. He collaborated and assisted in the preliminary drawings, and, as usual, the conception is of merit.

The Clawson School, which is illustrated, is of more recent design, and incorporates many salient features, which have been worked out in close collaboration with the school authorities. The assembly hall has been made sufficiently large and arranged so that it is easily converted into a gymnasium, with the lockers and showers to the rear of the assembly hall and at the ground floor. Thus the locker rooms and showers will also serve the schoolyard, which is one of the public playgrounds.

In arranging the class rooms of this building the east and west lights have been adhered to.

This is a three-story building and was designed as such so as to provide sheltered playgrounds in the basement. These playrooms are open on the east, giving a flood of light and fresh air to these places.

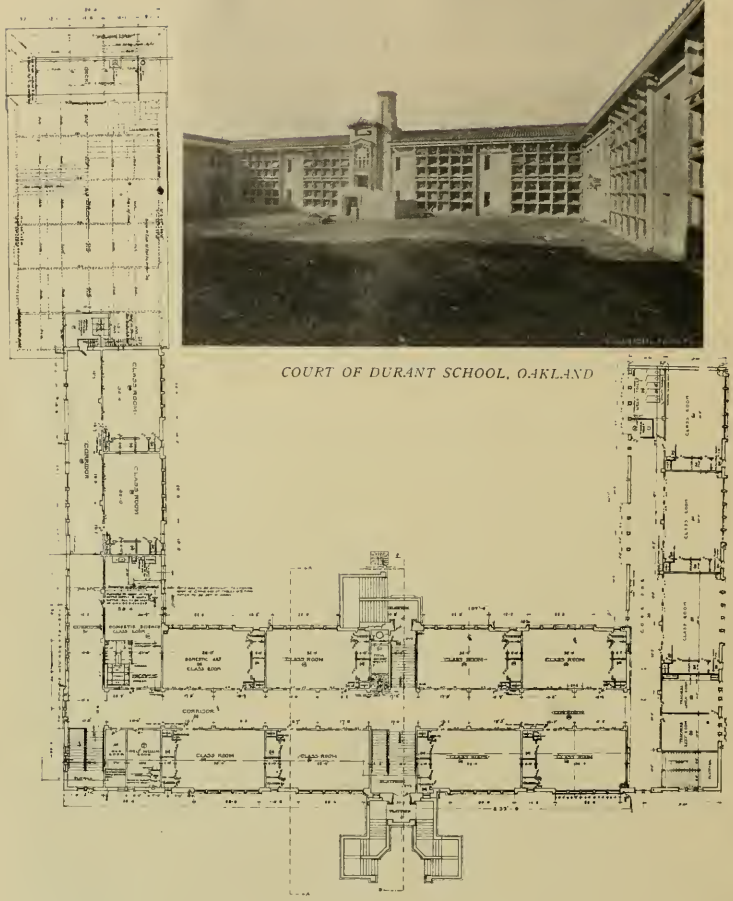
It is a composition reinforced concrete structure, trimmed with architectural terra cotta and varicolored buff face brick.

The classrooms in this building have been changed from the others in size to 22 feet 6 inches in width by 31 feet 6 inches in length, it having been found that regardless of the purpose to limit the size of the classrooms, additional seats, due to crowding, have been worked in. The previous size of classrooms was 20 feet 6 inches by 31 feet purposely made so in order to limit the number of seats to forty. It has been found, however, that the additional two feet will give better seating and aisle conditions and very slightly increasing the cost of the building.

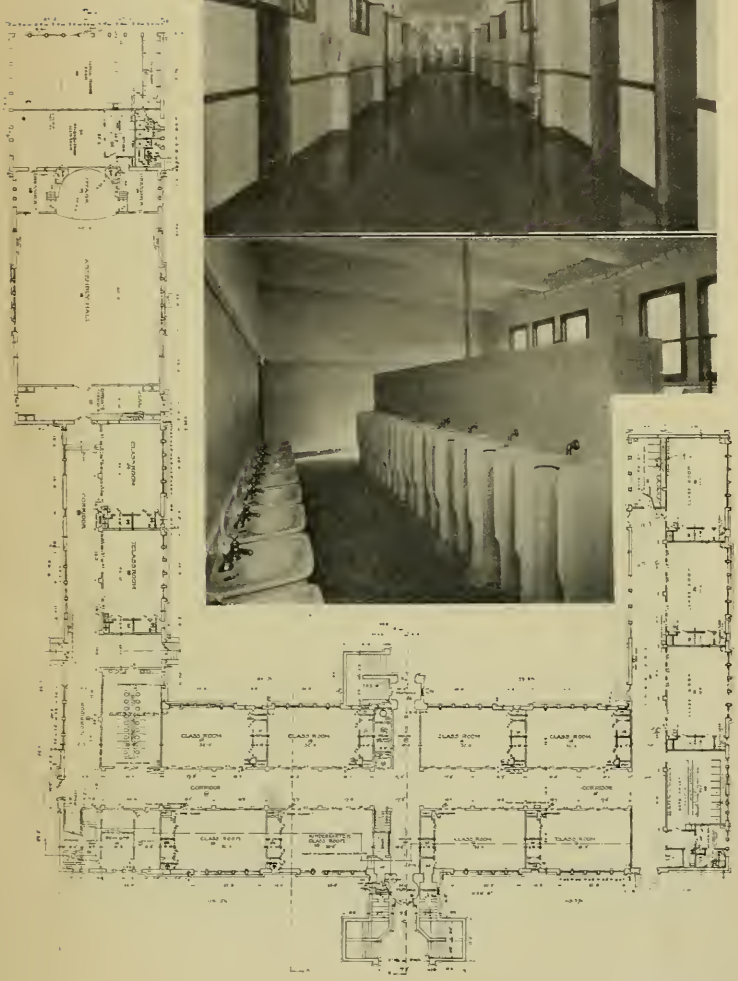
The cost of this building when completed will approximate $165,000.00.

The working out of the Emerson School proved to be a very interesting and delightful problem. On this work Mr. John Galen Howard was the associate

COURT OF DURANT SCHOOL, OAKLAND



SECOND FLOOR PLAN, DURANT SCHOOL, OAKLAND
JOHN J. DONOVAN and LOUIS C. MULLGARDT } ASSOCIATE ARCHITECTS



FIRST FLOOR PLAN, MAIN CORRIDOR AND BOYS' LAVATORY, DURANT SCHOOL, OAKLAND

CLAREMONT SCHOOL, OAKLAND
JOHN J. DONOVAN and WALTER D. REED } ASSOCIATE ARCHITECTS

LAZEAR SCHOOL, OAKLAND
John J. Donovan, Architect

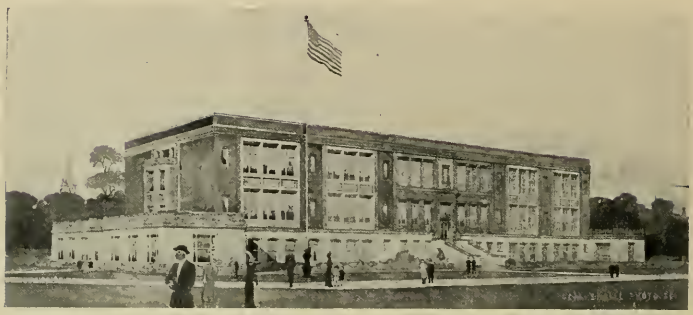
LOCKWOOD SCHOOL, SHOWING COURT, OAKLAND
John J. Donovan and Lewis P. Hobart, Associate Architects

FREMONT HIGH SCHOOL, OAKLAND
John J. Donovan, Architect

PATIO, JEFFERSON SCHOOL, OAKLAND, CALIFORNIA
John J. Donovan and W. J. Miller, Associate Architects

FRONT VIEW, CLEVELAND SCHOOL, OAKLAND
John J. Donovan and Shafer & Wilde, Associate Architects

REAR VIEW OF CLEVELAND SCHOOL, OAKLAND
John J. Donovan and Shafer & Wilde, Associate Architects



CLAUSON SCHOOL, OAKLAND
John J. Donovan, Architect

COURT OF SANTA FE SCHOOL, OAKLAND
John J. Donovan, Architect

ALAMEDA COUNTY INFIRMARY COMPETITION
Awarded Second Prize of $1,000
John J. Donovan, Architect

architect, and his work and assistance was of the greatest value, and the simplicity of the design and arrangement is sufficient evidence of the very happy co-operation.

This is a one-story reinforced concrete school building with two interior patios, assembly hall, playroom and cafeteria kitchen, separating the patios.

It will be observed from the floor plan that the orientation in this design is that of the east, south and west for the classrooms, and the north light for the manual training, domestic arts, science, club room, teachers' lunch room, etc. A very happy location has been assigned to the kindergarten, which is directly in the center of the south portion of the building and has an interesting pergola with a wrought iron railing designed in the letters of the alphabet. This is one of the most pleasing of the one-story type of schools.

The other schools which are illustrated have been developed from the requirements of the program, which established the sizes of the classrooms, the capacity of the assembly halls and the arrangement and location of the club rooms and libraries with regard to the use by the public.

In this respect a very careful study has been given the planning of the buildings. No city has attempted more in the wider use of the public school than Oakland, for each building contains a club room with its kitchenette for civic club uses, a branch of the public library, showers and locker rooms for the playground, dressing and bathing accommodations, and the spirit which prompted the extensive use of the school has been maintained in the working out of the various problems.

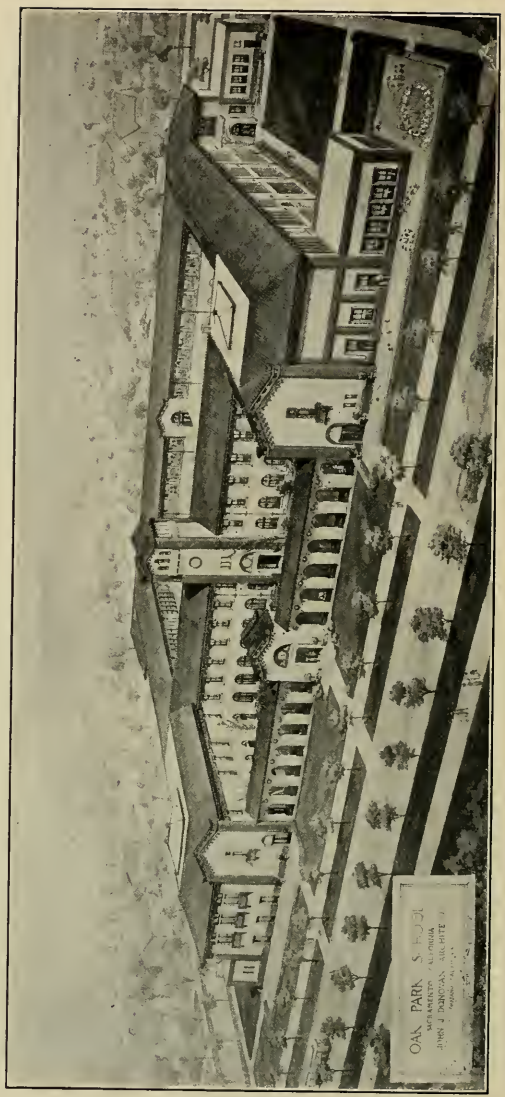
A most worthy and notable fact in the construction of these buildings has been the integrity of the entire operation; the hearty co-operation by the Board of Educaiton, the Commissioner of Public Works, Mr. Harry S. Anderson, and the City Council. The hearty approval which these buildings have received from educators and visitors is well worth the effort made to do something for once in a good, broad, liberal manner.

WASHINGTON SCHOOL, OAKLAND, BEFORE WINGS WERE ADDED

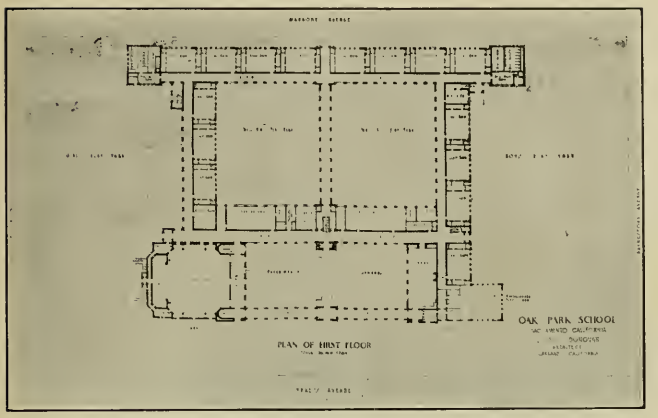
WASHINGTON SCHOOL, AFTER WINGS WERE ADDED
John J. Donovan and L. P. Hobart, Associate Architects

LONGFELLOW SCHOOL, BEFORE WINGS WERE ADDED

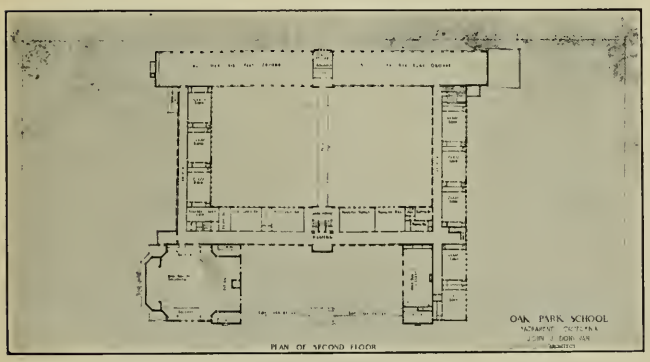
LONGFELLOW SCHOOL BUILDING, OAKLAND
John J. Donovon and C. W. Dickey, Associate Architects



ACCEPTED DESIGN FOR OAK PARK SCHOOL BUILDING, SACRAMENTO, CALIFORNIA
JOHN J. DONOVAN, ARCHITECT



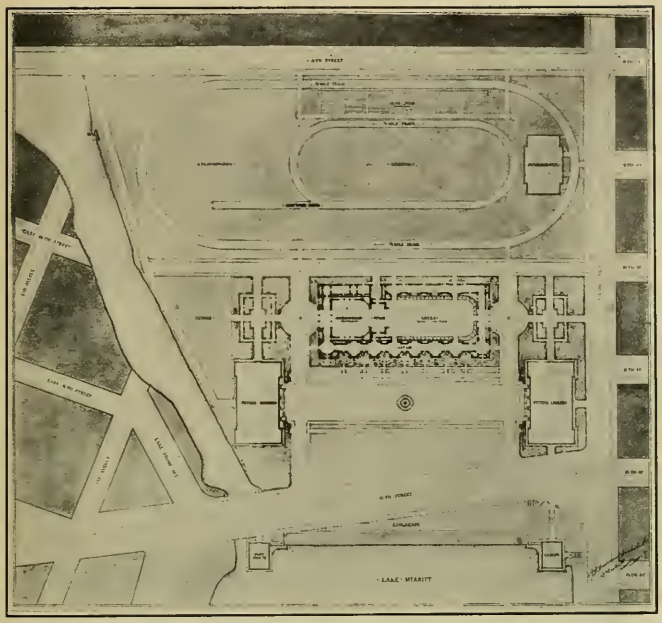
FIRST FLOOR PLAN, OAK PARK SCHOOL, SACRAMENTO
John J. Donovan, Architect



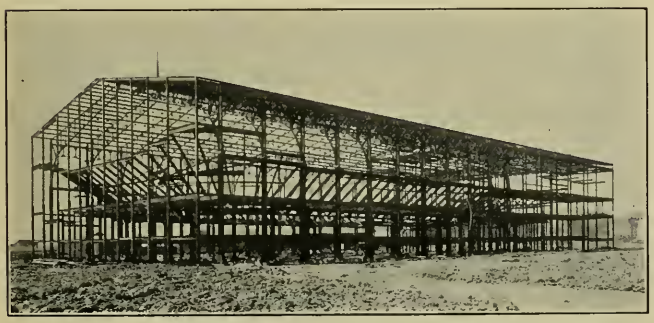
SECOND FLOOR PLAN, OAK PARK SCHOOL, SACRAMENTO
John J. Donovan, Architect

FRONT ELEVATION, OAKLAND AUDITORIUM
John J. Donovan, Architect, and Henry Hornbostel, Consulting Architect

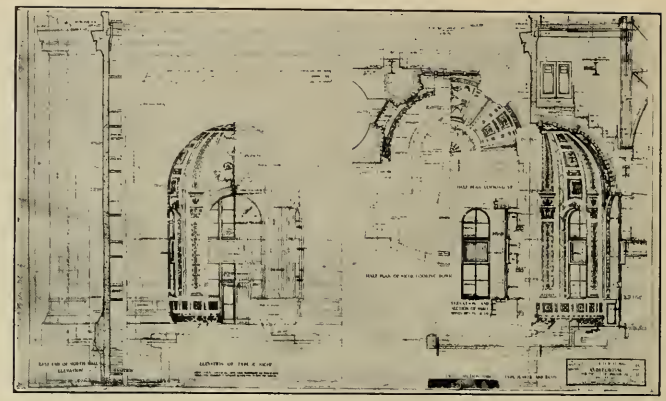
PERSPECTIVE, NORTH ELEVATION, OAKLAND AUDITORIUM



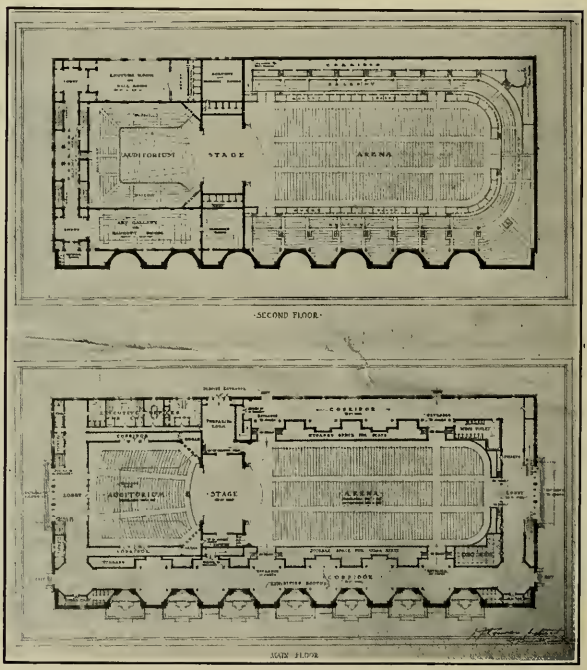
GENERAL PLAN, OAKLAND AUDITORIUM, SHOWING DEVELOPMENT OF CIVIC CENTER
John J. Donovon, Architect, and Henry Hornbostel, Consulting Architect



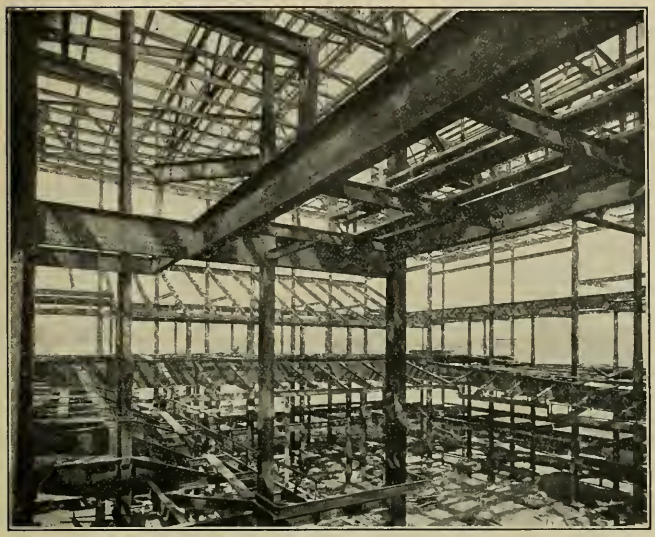
STEEL FRAME, OAKLAND AUDITORIUM



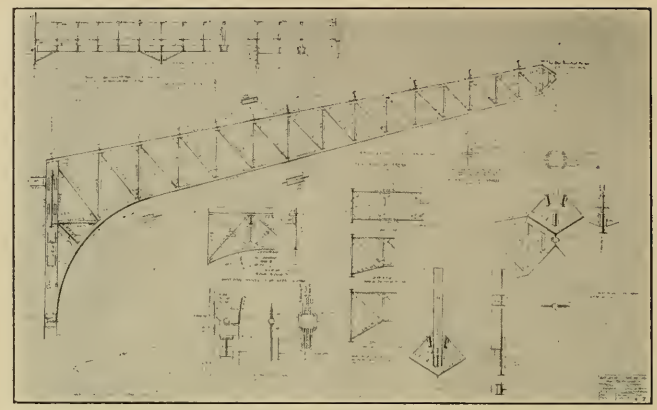
DETAILS OF NICHES, OAKLAND AUDITORIUM
John J. Donovan, Architect, and Henry Hornbostel, Consulting Architect



FIRST AND SECOND FLOOR PLANS, OAKLAND AUDITORIUM



SHOWING HEAVY STRUCTURAL STEEL CONSTRUCTION OF OAKLAND AUDITORIUM



STEEL DETAILS, OAKLAND AUDITORIUM
John J. Donovan, Architect, and Henry Hornbostel, Consulting Architect

SECTION OF FRONT AND SIDE, OAKLAND AUDITORIUM
From a photograph taken February 10th

Who is to Blame?

By J. F. SCHMIDT, in The Contractor and Builder

WHEN competitive bids for the construction of buildings are opened we find many new men in line with bids to present. The experienced men in construction business are falling off in number, many have given up in despair or have been forced to surrender unconditionally on account of the present system, under which profits to a contractor are practically impossible. The men who get the bulk of the work now are in most every instance beginners, men who have never served an apprenticeship in any trade and in most cases are in a position to care little about loss because from this evil they are immune, having nothing to lose.

This subject has appeared in the builders' journals at different times and was at one time discussed by the architects in meeting of their association, but up to this time no effective remedy has been suggested, and if suggested, it has not been put into practice. Shall the contractors wait until the architects, through mercy, work out the problem for them by reason of the trouble our architects find in getting the buildings up in good order and the bills paid, or will the contractors work out their own salvation by following the examples set by other industries and professions?

The position of the contractors is at this writing such as requires united action. When a bid is made up, based upon some of the contingencies which may arise during the construction of a building and such a bid is in competition with one not based upon any contingencies, the former bid is, of course, from 10 per cent to 15 per cent the highest and is sure not to be accepted by the owner. The specifications are always so drawn that the contractor is entirely at the mercy of the owner except in cases where the architect is of such a character that he will insist upon justice, in preference to the owner's good will.

One would imagine that an architect, when called upon to decide a question at issue between the contractor and owner, would see his own advantage first and lean to favor the owner because of his future work (there are plenty of contractors anyway). Some years ago this leaning on the part of the architect was perceptible, but the reputable architect of today has taken a different attitude. This must be attributed to the association and is therefore a splendid example for the contractor. A contractor of experience and substantiability can foresee many pitfalls in the business, knowing that a mishap or mistake, no matter who is morally or legally responsible, will interrupt the work and lead him into complications and money loss. It does not matter who made a mistake, the contractor is supposed to rectify it, if it is necessary to do so in order to be able to deliver a completed building and keep in good standing.

A contractor of no experience and of no responsibility does not foresee danger, neither can he lose what he does not possess. He is the more liable to bid low and as the work invariably goes to the lowest bidder, the most work is done by this class, which adds trouble for the architect, encourages litigation, creates bankruptcies, and loss to the owner—loss to the owner because repairs are often necessary soon after completion of the work.

You say that the contractor should give a surety bond. Can you recall many cases where the surety company is liable? If they were, they would not write bonds so freely. You say that the contractor should carry liability insurance. Do all contractors know that an insurance company is not liable where the contractor has not complied with the statute? How many contractors have time to read the statute? Here again the class of con-

tractors, who are such a detriment to sound business, have no reason to care what the statute is. Under the laws of Illinois, Wisconsin, Ohio, and several other states, it is necessary for the contractor to build a scaffold for work which was formerly done in the air. And it is necessary that a scaffold has a slatted or solid sailing and still if an accident occurs, the contractor is liable. Can such a contractor bid in competition with one who by reason of his lacking financial ability is not liable in any event?

Cost of bidding is an expense, which in the writer's office, amounts to one-tenth of one per cent of the cost of the buildings figured annually, and this does not include railroad fare. At this rate, with an average of ten bidders to a job, the waste on all of the work for which contracts are let is one per cent and is greater when adding the cost where contracts are not let. It is possible for an owner to get a long list of bids and sub bids, whether the work is let or not.

A remedy for the present evils can be effected by an association and that will be done sooner or later even if the architects must bring it about. These men have, through their association, bettered their conditions very materially. If the contractors wish in their own field to save their business, they will find it necessary to have some protection which is more effective than anything they have had. They will find it necessary to work together with the architects and support the high standard advocated by them.

Had the brickmakers in Chicago been without an association this year, they would have lost their business.

One suggestion for a remedy may be made which if worked out by contractors, may again build up a standard. When the owner invites bids, he should agree to pay for them. This would lead to care on his part as to the class invited and would cost him no more in the end. Under the present system the estimating is not and can not be done free of charge. The cost is added to the bid, but there is no inducement for the best men in the business to respond to an invitation. If a fee of one-fourth of one per cent were paid to the person making the lowest bid and a smaller fraction to each of the others, this would have a tendency to limit the bidders who make all the trouble and cause so much waste. It would create a better and happier condition for the owner, architect and builders.

It might enchance the health of men operating the legal machinery, who could be sent on a vacation, would result in better structures and be the means of a considerable saving in cost. If the contractors do not themselves benefit by the lesson set by other organizations and do not make an effort to work out their own salvation, then they can only charge the blame for the present adverse conditions to themselves.

* * *

Jimmy

An efficiency engineer of Cleveland said on the Hamburg-American pier in Hoboken:

"I am just back from England. In the offices over there they understand modern methods—they understand efficiency—about as little as Jimmy, the new office boy, did.

"'Jimmy,' said the boss, 'file these letters.'

"An hour later Jimmy said to the boss:

"'You told me to file these letters, sir; but wouldn't it do just as well if I trimmed them off with a pair of shears?'"

FIREPROOF SANITARY UNIT, CHILDREN'S HOSPITAL, NEW YORK CITY

Safety First in Hospital Buildings

By A. W. ECKBERG.*

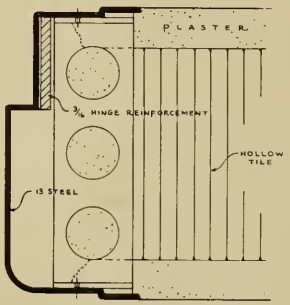
In times past a fire in a building was considered an unavoidable evil, but today it is regarded as a crime when caused by conditions which are preventable. The term "fireproof" is a mockery when applied to buildings fire-resistive in their construction only, and fitted with wooden doors and trim.

The ideal hospital has no inflammable material in its construction or equipment. From foundation to roof fire-resistive material is used and its doors, windows and trim are of steel. The occupants can now rest and recuperate in structures that are safe without the disturbing thoughts of a possible holocaust.—EDITOR.

STATISTICS prove that far more fires occur in hospitals and other institutions for those physically, mentally and morally helpless or defective, than in any other buildings. And it's the inmate of these very buildings who is least able, in fact, many times absolutely unable, to move to safety when fire threatens—he is at the mercy of the devouring, fast-increasing flames.

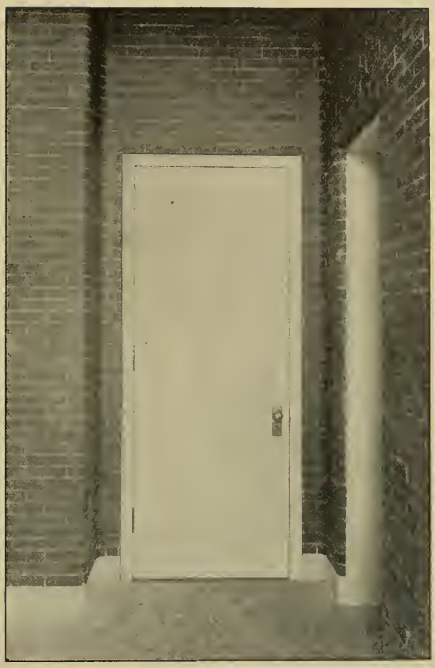
To succor the needy is certainly commendable—but how absurd to exercise rigid care in treating patients, while simultaneously housing them in either clearly non-fireproof or at best so-called fireproof buildings whose wooden doors and windows permit a fire to go from room to room, from floor to floor! Stone, brick or cement walls don't make a fireproof building, as has been demonstrated in a practical and convincing manner by the unfortunate fires of such so-called "fireproof" buildings as the

* With Dahlstrom Metallic Door Company, Jamestown, N. Y.



SECTION THROUGH METAL BUCK FRAME

METAL DOORS AND TRIM IN SISTERS' HOSPITAL, BUFFALO, N. Y.



A SANITARY METAL DOOR

Cincinnati Chamber of Commerce building, the No. 80 Broadway building, New York City, and more recently by the ruin of the Thomas A. Edison plant at Orange, N. J.

It is in hospitals, asylums and similar institutions that, if anywhere, safety should be particularly emphasized and sought in the construction and management of the building. The rapidity with which fires spread, unretardedly, once they gain any headway in such buildings, gives sufficient evidence of the prevailing errors of plans and equipment. Statistics show innumerable instances of fires that could have been confined to the locality of origin had floors been subdivided with incombustible partitions and doors and elevator and stair openings likewise protected.

By reason of insufficient appropriations many up-to-the-minute architects, while incorporating features of design, construction and equipment when planning new asylums, hospitals, etc., that are calculated to resist and control fire, realize that these provisions fall far short of what should be done to provide "safety first" for the occupants.

Owners in financing their buildings should provide their architect with means to make them safe. Existing institutional buildings should be altered to retard the spread of fire by the installation of incombustible partitions, metal doors, trim, etc., and be equipped to control fire.

Progressive communities are concerned about the safety of life in theaters and require necessary equipment with which to control fires and rigid precautions to be taken to avoid them. Of course, the lives of amusement seekers are ordinarily of more value to society than those of inmates of asylums, or of homes for the aged, or of alms houses, but society must care for unfortunates and incompetents and must give them safe shelter. And as statistics show that an institutional building has burned wholly or in part every five and a half days since January 1, 1908, it is clear that shelters as heretofore constructed are not safe.

The importance of protecting the structural parts of a building against the ravages of fire is generally conceded, but the necessity for interior fireproofing, which quarantines a fire in the room in which it starts and which thereby provides "safety first" and safeguards the lives of the helpless patients and the contents of the buildings has not been so well recognized until recently.

By the use of hollow metal doors, frames and trim, eliminating all wood, your building—if safe in other respects—will be fireproof in fact and not in name only. A fire cannot spread in such a building and the lives of the occupants will not be endangered from this source. Then, too, the insurance rate is lower for such a building.

In designing and detailing the doors and trim for hospitals, sanitariums, or institutional buildings, experts in sanitation and architects require all corners and crevices that would serve as lodging places for dust and disease-breeding germs to be eliminated. By making all mouldings and quirks rounded and smooth, the work is easily cleaned and kept in a sanitary condition.

* * *

Surface Imperfections

Imperfections in the exposed surfaces of concrete are usually due to one or more of ten well known causes, as follows:

(1) Variations in the nature of the cement, sand or stone.
(2) Lack of uniformity in the amounts of ingredients in each batch.
(3) Insufficient mixing in any or all batches of concrete.
(4) Lack of care in placing the concrete next to the moulds.
(5) Lack of proper protection in placing concrete.
(6) Efflorescence and discoloration of the surface.
(7) Unsightly construction joints.
(8) Imperfectly made forms.
(9) Dirt on the forms.
(10) Adhesion of forms.

The ends of reinforcing bars which are left protruding for splicing should be, if they are not likely to be connected up for some time, painted with some paint to diminish rusting and to guard against being bent or loosened.

* * *

Official Minutes, February Meetings of San Francisco Chapter, A. I. A.

By SYLVAIN SCHNAITTACHER, Secretary

A SPECIAL meeting of the San Francisco Chapter of the American Institute of Architects was held on Friday evening, February 12th, at the Techau Tavern, in honor of Monsieur Henri Guillaume, representative of France in the erection of the French Pavilion at the World's Fair grounds.

Among the guests present were:

Monsieur Henri Guillaume, Maurice Couchot, Bernard R. Maybeck, Mr. Sperry, Paul Denevielle, Mr. Alden, Mr. Turnbull, Loring P. Rixford, J. C. Morrell, Mr. Takeda, Mr. Ito, Henry Hornbostel.

Chapter members present:

Walter D. Bliss, Wm. B. Faville, Arthur Brown, Jr., Harris Allen, Charles Dickey, William Knowles, John Bakewell, Jr., J. S. Fairweather, G. B. McDougall, Wm. H. Crim, Jr., Albert Farr, Walter H. Ratcliff, Jr., John J. Donovan, Oswald Speir, Charles S. Kaiser, John A. Baur, E. J. Molera, Sylvain Schnaittacher, B. J. S. Cahill, Edgar A. Mathews, William Mooser, William C. Hays, O. G. Traphagen, Bernard J. Joseph, Matthew O'Brien, Albert Schroepfer, Willis Polk, George Kelham, John Galen Howard, Edward J. Vogel.

Mr. W. B. Faville, president of the Chapter, presided over the banquet.

Mr. McDougall, the past president of the San Francisco Chapter was called upon for a toast to the guests of the evening.

Mr. Polk was called upon to welcome the guests. Mr. Polk spoke fluently of the great Stars in Architecture the world over and of the stride made in America, and assured Monsieur Guillaume that America realized and appreciated the debt she owed to France for her architectural guidance.

Mr. Allen of Berkeley and Mr. Sperry of San Francisco then sang a duet.

Mr. Hornbostel, as president of the Beaux Arts School in New York, spoke of the inner workings of that school and the wonders it has accomplished in New York, and how this school is now turning out American modelers. Mr. Hornbostel congratulated Mr. Maybeck upon his work on the Fine Arts Building and said from this day on he would take his hat off to Mr. Maybeck.

Mr. Faville said in part:

"This gathering and the theme of the evening is to express an appreciation of the debt we owe to France for her architectural light; to the Ecole de Beaux Arts for its guidance and to its professors who have so faithfully labored in our Universities. I will ask Professor Maybeck to speak of the Ecole de Beaux Arts, its traditions and the spirit of this school in which Professor Maybeck studied, worked and played."

Mr. Maybeck was then called upon for an address. He thanked Mr. Hornbostel for his kind remarks in reference to the Art building and took his audience back into history some 200 years. He pointed out in a clear and scholarly manner what American architects had learned from France and the great impulse she had given, not only to America, but to the whole civilized world.

Mr. Faville then spoke of the professors of France in our universities, and in introducing Arthur Brown, Jr., said in part:

"Mr. Arthur Brown will tell us of the works of the French professors in our universities and their accomplishments, for he has spent many years in the ateliers of France and is conversant with the spirit both abroad and at home.

"Enviable honor has been offered Mr. Brown by the Harvard University. They have asked him to accept in that university the chair of Architecture. We know from the high standard of this university that the honor is not lightly bestowed."

Mr. Brown said: "It seems very proper on this occasion to pay tribute to the French architects who have taught in our technical schools, as Mr. Guillaume's very distinguished father, Mr. Edmond Guillaume, was for many years Professor of the Theory of Architecture in the Paris school and in that capacity was the representative of the trend of architectural education in France.

"Clearness of thought and expression is one of the striking characteristics of the French mind, and to this quality is due, I think, much of their success as teachers of the arts and sciences. This talent for teaching has long been recognized in our country, and many of our leading schools have, during the past few years, sent to France for some of their teaching staff."

Mr. Faville, introducing Mr. John Galen Howard, said:

"Mr. Howard has kindly consented to speak upon La Belle France."

Mr. Howard expressed himself as being very thankful for the privilege and honor of being able to address the San Francisco Chapter before such a distinguished guest as Monsieur Guillaume and of other representatives of the different nations. With it also came a certain obligation and that was the overwhelming importance of the subject upon which he had been asked to speak. He said: "I cannot even begin to touch upon the most important phase in the claims that France has upon our civilization and the gratitude we owe to that nation."

Mr. Faville, in calling upon Monsieur Henri Guillaume, the guest of the evening, said in part:

"Monsieur Henri Guillaume, it is with extreme honor that we address to you the remarks of Messrs. Howard, Maybeck and Brown. They are tokens of the love and respect in which we hold your country.

"We trust that you will accept the assemblage of our fellow architects tonight as an expression of the appreciation with which we hold the teachings of your patrons and ateliers, an appreciation of the importance to us which your teachings have been in the development of our architecture, and we beg to convey to you the distinction which your presence at the Exposition affords us and our pleasure at your being able to be with us tonight, which is to express our appreciation to France for her architectural light; to the Ecole de Beaux Arts for her guidance and to her professors who have so faithfully labored in our universities."

Monsieur Guillaume replied in the French language, expressing his thanks to the San Francisco Chapter and the architects of San Francisco for the honor bestowed upon him, his nation and the Architecture of his native land, while over fifty of the leading architects of San Francisco and bay cities bowed their heads to France for their guidance in architectural development.

President Faville continued: "As guests this evening we are pleased to have with us Mr. Takeda and Mr. Ito from the Kingdom of Japan, representatives sent to the Panama-Pacific International Exposition to erect their pavilion and to create the garden so expressive of the land of the Cherry Blossom.

The president then called upon Mr. Takeda of Japan and Mr. B. Ito, representing Mr. Takeda, in an able way addressed the meeting and expressed his appreciation in being honored by the architects of San Francisco.

Mr. Faville then called upon Mr. J. C. Morrel of Australia.

Mr. Morrel told of how Australia was reaching forth for knowledge in architecture and how the Australian Government was sending men to this nation, as well as others, for information of vital interest along the lines of architecture.

The banquet then adjourned.

OFFICIAL MINUTES OF MEETING OF FEBRUARY 26 1915

An adjourned monthly meeting of the San Francisco Chapter of the American Institute of Architects was held at the Tait-Zinkand Cafe, 168 O'Farrell street, on Friday, February 26th. The meeting was called to order at 1:30 by Mr. Faville, the president.

Mr. Ellinwood of New York, and Mr. Martin, of the Southern California Chapter, were present as guests of the Chapter.

Minutes

The minutes of the meeting of January 21st and the special meeting of February 12, 1915, were read and approved.

Legislative Committee

Mr. Mooser was called upon by Mr. Faville to give a resume of what had been done regarding the law of 1872 since the last meeting. He stated that repeal bills had been introduced in the Senate and referred to the Educational Committee and also in the Assembly and referred to the Judiciary Committee.

Some discussion followed and it was duly moved, seconded and carried, that the report of the committee be accepted and the matter left as before, in the hands of the Board of Directors for any necessary action.

Mr. Schnaittacher reported that a bill had been introduced, amending the "Act to Regulate the Practice of Architecture," and that it was desirable that the architects be informed as to the measure. This matter was also placed in the hands of the Board of Directors by the action of the Chapter.

Communications

From Charles Butler, secretary New York Chapter, A. I. A., extending invitation to the San Francisco Chapter; communication from Henry A. Schulze, notifying the Chapter of receipt of letter from the Institute advising him that his resignation had been accepted as of effect of December 4, 1914; from Commission of Immigration and Housing, inviting the Chapter to attend the Housing Exhibit of the Commission, from Burt L. Fenner, secretary A. I. A., relative to convention at Los Angeles, and one relating to the Board of Directors' resolution to the law of 1872; from Panama-Pacific Insurance Club, regarding celebration of "Nine Years After Event"; from American Federation of Arts appealing for preservation of monuments of art from the present war in Europe and one regarding the convention to be held in Washington May 12-14, 1915; from National Conference on City Planning, Boston, enclosing Bulletin of same; from H. C. Jones, representing the 28th District of the California Legislature, relating to the law of 1872; from California Employers' Federation relating to measure to be introduced at this session of the Legislature relating to the erection of tenement houses; from the Mayor's office, requesting a representative to attend conference on tenement house conditions.

New Business

In regard to the communication from the Mayor's office, requesting that the Chapter be represented at the conference arranged by the Commission of Immigration and Housing, it was stated that Messrs. Bakewell, Mathews and Mooser had attended the meeting; that much proposed tenement house legislation had been discussed and it was suggested that inasmuch as another meeting was to be held on March 3d, that as many members as possible, of this Chapter, attend, and therefore the secretary was directed to notify all members by postal to attend the meeting.

A letter from Mr. Henry A. Schulze, a past president of the Chapter, having been read and stating that he had retired from the active practice of his profession, it was duly moved, seconded and unanimously carried that Mr. Schulze he made an Honorary Member of the Chapter.

It was duly moved, seconded and carried that this Chapter endorse the proposition of acquiring the Sutro land.

The matter of the Chapter's membership in the Pacific Coast Architectural League was brought up by Mr. Bakewell and discussed at some length. It was then duly moved, seconded and carried that the Chapter be represented at the next meeting of the League and that some plan of reorganization be proposed for discussion at that time.

Mr. Rudolph A. Herold of Sacramento was invited by Mr. Faville to talk to the Chapter. He expressed his pleasure at being present and stated what had been done in Sacramento in the formation of the Civic Architectural League, and extended an invitation to the Chapter to arrange for a meeting at Sacramento at an early date.

* * *

Basis of Current Practice in Design of Reinforced Concrete Structures

C. A. P. TURNER, consulting engineer, Minneapolis, Minn., and well known on the Pacific Coast, read a paper entitled "Basis of Current Practice in Design of Reinforced Concrete Structures" at the American Concrete Institute in Chicago in February. Mr. Turner said in part:

The universally accepted basis of reinforced concrete design may be summarized in the following stock quotation from building codes (see the Chicago, San Francisco, Columbus codes, or those of other cities):

"The adhesion is such as to cause concrete and steel to act together"—or

"The bond between the concrete and the steel is such that the two materials shall act as homogeneous solid."

Adhesion or bond is thus generally accepted as the connecting link between the concrete and the metal and we should naturally expect to see its operation discussed in all the literature of the art found in text books and the like.

The problem of the continuous flat slab of reinforced concrete is one which the writer has studied continuously for something like seventeen years, and it is needless to say this study from the scientific viewpoint has not been unaccompanied by many investigations and tests of finished structures. Incidentally the writer has many times designed reinforced concrete floors with two-way continuous beams from support to support and made many tests of such structures, and has also built and tested simple beam structures where the work covered single spans as well.

In any structure in which there is combined stress or stress of the same kind acting in two directions it is a well known fact that these stresses tend to reduce each other or increase the resistance to deformation by mutual action.

Grashof undertook to account for this relation in the operation of a homogeneous plate by the general equations of internal stress and the introduction of Poisson's ratio. In the reinforced concrete plate we have only an imitation of the homogeneous plate. The Poisson effect, or the increased resistance by the co-action of stresses in different directions, would not be a property of either the concrete or the metal but a function of their co-action arising from indirect tensions and compressions due to bond shear.

Dr. Eddy has accounted for the deportment of such reinforced concrete plates in a very satisfactory manner by taking a co-efficient representing the lateral action as .5. This step in Dr. Eddy's mathematical solution has been treated by some members of the engineering profession as involving the mystery of Poisson's ratio, in which they have no faith at all. Let us see how far the doctor's mathematics is affected by Poisson's ratio.

The working stress is also reduced in the same ratio. This does not account for a difference of approximately 300 per cent found in the deflection formula for the continuous beam and the continuous slab and we must turn back to the bond shear relations which I have pointed out in order to understand the matter clearly.

It has been noted that these empirical co-efficients are such that the stiffness of the continuous beam when combined integrally with a slab is six times as stiff as a simple beam, its stiffness having been increased by the slab with which it is combined from being five times as stiff as a simple beam, as it is in general case of a continuous beam to six times as stiff, as it is in this case.

This relation can be best understood by consideration of the theory of work discussed very fully in the recent treatise by Dr. Eddy and the present writer, which

has been already referred to, in which is shown that where circumferential resistance act in circles about the tops of the columns energy is stored in such a manner that it does not affect the vertical geometry of the slab. When, however, the panel is rectangular these resistances act in ellipses about the column tops and the energy is no longer stored in a manner which does not affect the vertical geometry of the floor, but it does affect to a considerable and increasing extent as the panel becomes more and more oblate.

Comparing the continuous plate with the simple beam, the continuous plate with the same cross section of steel at mid span in the square panel, assuming that Poisson's ratio equals zero, is by the theory of work approximately six times as strong and twenty times as stiff as the simple beam with the same cross section of steel and thickness of slab and a span equal to the diagonal of the panel.

The absurd character of the regulations in vogue in many cities will become apparent from these relations, which have been presented in a simple manner from the standpoint of experimental evidence from hundreds of tests and from the standpoint of theory of work, assuming Poisson's ratio equals zero, as well as from the consequences derived from the general equations of equilibrium of an infinitesimal element in which the lateral effects are given proper consideration in the mathematical determination of deflections and stresses from one and the same formula.

The law governing the mode of operation of the connecting link between the concrete and metal determines the limiting steel ratios. We have 50 per cent of the building codes in the United States requiring 50 per cent more steel than is necessary to develop the concrete used in the continuous slab on column supports. Here, then, is an opportunity for economy without reduction in the safety of the structure.

The Chicago code while requiring computed steel stresses 100 per cent at mid span greater than determined by test, allows in a light rectangular slab a thickness so small that the true concrete stresses may under test be at least 50 per cent higher than would be computed. This relation is brought about by an irrational comparison of the rectangular slab with a square slab having a side equal to the average of the long and short sides of the panel. The gross error involved is evident from the deflection formula given and the well known relation of steel stress to deflection in any fixed arrangement of steel.

In the design of simple slabs or wide beams there is hardly a code that I have examined which would not, under the rules followed, literally permit double the amount of steel to be used which an experienced engineer would employ to develop the concrete element. Here is an opportunity for the regulations of our cities to be greatly improved, because these rules are supposed to govern the conduct of those who are lacking in experience as well as those who have had the benefit of this experience, and the structures figured under the letter of the law may prove unsatisfactory.

In the provision for shear little attention has been paid to the difference in the horizontal shearing deformations of the continuous and the simple beam. This has been discussed quite fully by Eddy and Turner in their treatise, and it has been shown that the continuous beam is capable of resisting double the shear that the simple beam can carry.

Having discussed briefly beam action and slab action, it is next in order to consider the question of columns. The variation in the regulations of different cities amounts to more than 100 per cent in the amount of material required in the construction of columns for the same load. Such a variation cannot evidently be based on any rational hypothesis.

The American Society joint committee has rules governing column design which render such columns as were designed in the Edison factory more economical to build than tough, strong, reliable hooped columns such are are usually built in the western cities, and particularly in the northwestern sections of the United States and Canada where the enhanced safety in cold weather work coincident to this form is recognized and appreciated. The rules devised by the joint committee seem to be based on tests so conducted as to preclude or prevent the coaction of the concrete and metal. That is, test data have been secured from test specimens in which the longitudinal steel and concrete were made to bear equally on the face plate of the machine. The results from such tests can evidently have no relation whatever to the strength developed in a column of a building properly designed.

The committee on concrete and reinforced concrete of the Canadian Society of Civil Engineers has exihibited a higher order of mechanical intelligence in their rules relative to the design of columns than have the committee of the American society, since they permit reasonable working values which encourage the design of columns well hooped and vertically reinforced.

The great divergence found in test results of columns was the subject of careful consideration by the writer for several years and formulas which would fit test results were found only by taking into consideration the end condition of the vertical steel. This has been discussed quite fully in the recent treatise by Eddy and Turner.

Why Apartment House Loans are Good Investments

THE question has been repeatedly asked, "What does the high class apartment house offer as an inducement to the mortgage investor?" In order to reach a satisfactory solution of the question it would be well to indulge in a restrospect, then consider the present status, with a view of forecasting the future, writes John Finck in the New York Herald.

Apartment houses came into existence as a substatute for private houses in order to meet an enforced economy and for the further general convenience of the housewife, who found greater ease there in the compactness of her surroundings. These general conditions proving satisfactory, the "fad," as it was first considered, took deep root and spread with such rapidity that it soon became a fixed institution, with all the traditions or originality obscured in a dim past.

This class of building will always retain its strength and readily impresses the cautious mortgage investor. We must not confound this class of building with apartment hotels, which, being used for a specific purpose, do not meet with the same generous approval of the mortgage investor as do apartment houses. The lessening of building construction within recent years has tended to bring about an increased tenancy, which in large measure offsets the natural depreciation in values.

The general situation presents an element of hope, and there is no substantial cause for pessimism.

A high class structure should be at least sixty-five feet in width, to-wit, the frontage of three ordinary private houses. Such houses have in large measure superseded the dwelling. Built in first-class neighborhoods, there is but slight danger of loss of value, while also there is very little impairment to a solidly constructed building.

This class of security has appealed to the permanent investor, as a result of which a large part of our high class apartment houses have attracted the wealthy of other cities, who have used this means of investment as a profitable outlet for their surplus funds.

This class of property has been recognized as stable, and, being in strong hands, offers the best possible security to the mortgage investor. Tenanted by a steady class, the loss of rent is minimized. The higher class of apartment houses have divorced from palatial residences many of our most prominent citizens.

Large lenders, including banks and trust companies, have been attracted by this class of security, and as a result heretofore there has been no difficulty experienced in obtaining favorable mortgage loans at reasonable rates of interest. Foreclosures have been uncommon, and at the worst losses have been slight. Strengthened by the knowledge that there is a bulwark of financial strength behind them, as most of the owners have bought for investment, not speculation, there is a further sense of security in the mind of the investor in such mortgages. The same inducements which heretofore have swayed the investors are still in force.

The future of the apartment house is no longer problematical. It has been grafted onto our domiciliary system, and is sure and lasting.

During the last few years, while the general class of property has not stood the acid test of adversity, yet apartment houses as a class by themselves weathered the general depreciation without any noteworthy loss to owner or mortgagee.

It is this statistical fact which holds for the owner of apartment houses the favor of mortgage investors.

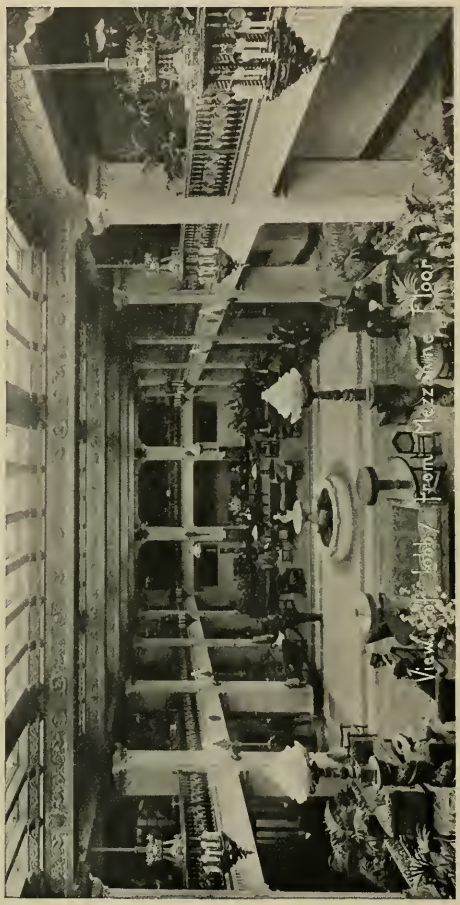
THE NEW DAVENPORT HOTEL, SPOKANE
Cutter & Malmgren, Architects

The Davenport Hotel, Spokane, Washington

THE accompanying plates show the class of hotel construction that is being carried out by architects in the Pacific Northwest. The pictures show the completed Davenport Hotel at Spokane, designed by Messrs. Cutter & Malmgren, architects, of that city. The style of architecture is Florentine, with an exterior finish of red pressed brick, brown colored terra cotta and Boise sandstone.

A notable feature of the great hotel, which cost close to $1,000,000, is the dining room designed in the Spanish renaissance. Graceful columns on either side of the room support an elliptical ceiling of an arcade. The color treatment is in old ivory. Soft colors have been introduced into the running design of birds hares, turtles, fox, etc., on the ceiling beams. Grotesque figures are used in the bolsters surmounting the Corinthian columns.

The Chinese buffet is executed in colors of blue, red and gold. The cyprus wainscoting is finished to a suki wood with details of characteristic



VIEW OF LOBBY FROM MEZZANINE FLOOR OF DAVENPORT HOTEL
CUTTER & MALMGREN, ARCHITECTS

ENTRANCE LOBBY, DAVENPORT HOTEL

CORRESPONDENCE ARCADE OF LOBBY

LOUNGE ON MEZZANINE FLOOR, DAVENPORT HOTEL

BARBER SHOP, DAVENPORT HOTEL

MAIN DINING ROOM OF THE DAVENPORT HOTEL, SPOKANE

MARIE ANTOINETTE BALL ROOM, DAVENPORT HOTEL
Cutter & Malmgren, Architects

CHINESE BUFFET, DAVENPORT HOTEL SPOKANE, WASHINGTON

conventional oriental design. The floor is of red Grueby tile. The whole scheme artistically expresses a true Chinese atmosphere.

On the mezzanine floor are located the Marie Antoinette ballroom, the Elizabethian banquet room, the state suite, hair dressing parlors, gentlemen's smoking room and retiring rooms. The ballroom is finished with panels of French grey, mouldings of panels, etc., in light ivory with much of the ornamentation picked out in delicate blue and rose. Balcony and French window hangings are all of rose color. Interspersed along the frieze of the balcony are medallions carrying jester heads, which contribute much to the feeling desired. The Elizabethian banquet room is finished with wall panels of oak. Surmounting the wainscoting there is a frieze showing heraldic emblems. A special feature of this is the clever system of disappearing doors which make it convenient to divide the floor space in three private dining or committee rooms.

The entire study, whether involving exterior or interior details, whether applied to the choice and arrangement of colors, whether given to the laying out of the floors for maximum convenience and efficiency of service, is a product of which the architectural firm of Cutter & Malmgren, Spokane, may well be proud. The construction, though new, is truly old in mental conception and execution.

ELIZABETHAN BANQUET ROOM DAVENPORT HOTEL

How the Amateur Describes a Skyscraper

WHAT the magazine writer unfamiliar as he often is with the technical features of his subject, has to say in his descriptive picture of a happening is frequently very amusing to those acquainted with the facts in the case. An instance of this kind is illustrated in a decidedly striking manner by a correspondent of the Scientific American, who thus quotes from and comments upon an article descriptive of a skyscraper in a monthly periodical:

"The old brick building had vanished . . . in a cloud of broken brick" (cloud of brick) "and plaster. Already the muddy floor was dotted with the toadstool tents of the excavators. . . . Far down in the stifling air of the caisson" (stifled oxygen) "the concrete roots were being planted, tied with cement and steel to the very core of the world.

"The foundations were finished and the first thin columns" (weighing possibly one ton per foot) "stretched upward. In ordered plan, the crossbeams fell into their places, and the great lattice of the substructure" (that is to say, superstructure) "shaped itself.

"On the topmost story the derricks crouched like giant spiders, thin legs braced against post" (or was it column?) "and I-beam. Untiring, hour after hour, the derricks lifted bales of steel, and as each story was bolted down" (by the pneumatic riveters) "the derricks lifted themselves heavily to the new level. . . .

"Like beetles the steel workers clambered surefooted over the empty frame. Like flies they caught the slim-spun threads of the derricks and sung up to some inaccessible" (although they did get there) "height.

"Day faded in fog and darkness. Like beacon fires the forges of the workers glowed intermittently" (showing conclusively that scab labor was being employed).

"I am thinking also of the other workers; of men who measured this tall tower on their slide rules" (and worked out the formula for long columns on their tape measures). "Engineers who foresaw each bolt and fitted so perfectly mass on mass" (without any previous experience and) "with only imagination and their books of figures to guide them; . . . workers in the steel mills of the distant city who moulded" (or perhaps rolled) "each beam and pillar to go together like a watch—theirs in the silent, forgotten labor."

Let us hope (adds the correspondent) that these nocturnes by untechnical men will be as soon forgotten!

* * *

Talked on City Planning

Charles Edward Cheney, editor of the City Planning and Book Review Departments of the Architect and Engineer of California, addressed the March meeting of the Los Angeles Chapter, American Institute of Architects on "City and House Planning," illustrating his talk with numerous stereopticon slides.

* * *

His Application

An alien wished to be naturalized and applied to the clerk in the office, who requested him to fill out a blank which he handed him. Here are the questions and answers:

"Name - Jacob Levinski."

"Born - Yes."

"Business - Rotten."

Professional and Other Incompetence

By W. B. FAVILLE, President San Francisco Chapter, A. I. A.

EDITOR THE ARCHITECT AND ENGINEER:—

In the January issue of your publication there was a most unfortunate article in regard to architects and their business ability. The article describes a point of view which the public is only too prone to accept without questioning its truthfulness.

On behalf of the San Francisco Chapter of the American Institute of Architects I am sending you an article which appeared in the February issue of The Journal of the Institute decrying such foolish tirades as this against our profession.

The struggle of the Institute and our local chapter is to arrive at an understanding of professional ethics among ourselves, to realize the debt we owe to the community, and to inform the general public in reference to our duties professionally. These are important aims and we feel your publication should always lend its influence towards constructive instead of destructive criticism.

(Journal of the American Institute of Architects.)

LIVES there a man who has not visited his indignation, in a moment of wrath, upon some profession or other? We fancy not. The temptation at certain moments is far too great, and the outburst too completely satisfying. One seems to feel, after having delivered that particular curse, that one has made a great social and economic discovery. At last all the cobwebs have been swept away, and the whole miserable fraternity are exposed to the light of a righteous indignation and a perception which has at last pierced the sham. One flatters oneself upon an epoch-making discovery, the effects of which may not even be forecast. But somehow or other, the professions still increase and multiply. The world listens but does not hear.

Most of us are at times given to sarcastic allusions to some one or other of the callings which frequently appear to prey upon us, and try our sense of justice beyond the breaking point, and the men who fly to the public press as a means of more completely airing their grievances against the professions are not by any means small in numbers.

In the Real Estate Magazine for November [reprinted in the Architect and Engineer for January, with comments by F. W. Fitzpatrick], one may read a particularly venomous attack upon the architectural profession. We opine that the excess of venom will cause it widely to overshoot the mark, for nothing rouses the sense of justice so much as a vulgar tirade. In this particular article, the owner of a hotel in the city of Minneapolis condemns the whole profession of architecture in language which is at once the most conspicuous compound of ignorance and bad taste which we have come across in some time. We do not attempt to pass upon the merits of the particular question, nor to resent anything except this sweeping denunciation of architects.

Incompetence is indefensible. Professional incompetence exists wherever any profession is practiced. Incompetence runs riot through every walk of life, in every trade and calling; many of us have suffered from the peculiarly trying incompetence of that class of men to which the writer of the article in question belongs. But we may still agree that hotels are necessary, and not to be abolished because of the shortcomings of one man.

A little thought will convince even the most bitter of men, provided he has a modicum of reason in a lucid moment, that professional incompetence thrives upon public incompetence. Behind the incompetent in any profession will be found the incompetent man who is paying the bills. He is, perhaps, too ignorant to know better. He picks his doctor, lawyer,

architect, engineer with a great and rather pitiable faith that the title implies qualification. On the other hand, there is the incompetent individual who encourages incompetence by deliberately buying it. Unwilling to concede that the worker is worthy of his hire, he bargains on the basis of fee or price. In employing an architect he not only refuses a remuneration which will permit the architect to give his full service, but he also frequently imposes upon a half dozen men to the extent of obtaining free sketches and rough plans. Playing one against the other, and relying upon their various degrees of necessity, he finally drives the bargain which appears to him to be the best. He has merely bought and paid for an incompetent servant. These poor devils never get a chance to lift their heads above water. Capable, perhaps, of giving competent service if given half an opportunity, they continually find themselves so financially embarassed that they are at the mercy of every scheming seeker for their services. Their incompetence is perpetuated by these schemers and bargainers, who merely comprise another race of incompetents. The thing runs through our social and economic fabric, as the law of prey runs through the animal kingdom.

There is, of course, the more exceptional incompetent who is so clever that he is long in being discovered, and who waxes fat in the meantime. But he can be avoided if one will take the trouble.

To what degree is incompetence fostered by the educational systems through which men and women enter the various professions? To what degree is incompetence allowed to experiment upon the public by reason of that premise which assumes that the ability to secure work confers the right to practice? How far has incompetence been encouraged by either the desire or the necessity of obtaining a remunerative practice within the shortest possible space of time, and at a period when the ramifications of every profession are becoming so increasingly extensive that it can scarcely be true that the preparatory stages may be made less and less thorough? And last, but by no means least, what is the degree of incompetence due to the selection of a profession as a mere means of livelihood and nothing more? No study of professional incompetence would be complete unless it included all of these phases—a long, difficult, and perhaps impossible accomplishment.

But the answer of the incompetent public, disappointed in a particular instance, is ever the same. The profession, whichever one it may happen to be, is wholly at fault, and all of its members are included in the sweeping anathema which the disappointed buyer sows broadcast. It has always been so. Probably it will always be so. It is sure to be so as long as we have no higher standard, and no better understanding, of the professional relation, or as long as the present economic system deludes people into the belief that the price of a thing represents its cost.

The reverse of the picture is quite true, since competent men are continually seeking their kind. The competent man is not deluded by any magical quality of title, and wishes to know something of the man who stands behind it. He engages professional services on some other basis than that of price or a mere social relation. To him, the selection of an architect is perhaps the least difficult of his problems, for of all works which are writ so large that all men may read, that of the architect is surely not the least. It requires no extraordinary mental powers to make a judicious selection of the man who is to be given charge of an important building operation. One has only to lay sentiment aside, and cast loose from the thought of trying to secure service for less than it costs the architect to give it. Those are the two popular delusions which operate to befog the owner. It is through them that architectural as well as all other forms of professional

incompetence drag out their miserable existence,—a tax upon those who buy, upon those who sell, and a dead weight hung about the neck of society.

The deplorable feature, so far as any profession is concerned, is that the most honorable, upright and conscientious practitioners are forced to pursue their task of trying to raise the standard of the profession, while enduring and combating the opprobrium called down upon them by their incompetent brethren. But such is the very reason why professional standards rise so slowly, —it is sometimes amazing that they are able to rise at all. The one remedy is a higher standard of personal responsibility, quite as much to the employee as to the employer, and a different conception of the relation of any work to life itself.

In his answer to the article to which we have reference, and which appears in the Real Estate Magazine, Mr. Ackerman (M) seems to sum up the whole matter in a very few words:

"There are in the profession many men possessing ability, integrity, and sincerity of purpose, whose aim in life is to raise the practice of architecture to the highest level. It rests absolutely with the clients to say whether these men shall be rewarded for these qualities and assisted in their effort. Such reward and assistance every owner can contribute to architecture; this much he can do toward maintaining and elevating the standards of the profession."

To such an attitude on the part of a steadily increasing number of clients every competent professional man and woman is extending a hand of grateful welcome.

* * *

May Be Competition for State Building

ARCHITECTS throughout the state of California are naturally much interested in the plans of the authorities relative to designing the proposed $1,000,000 state building in San Francisco and the two or more other State buildings in Sacramento, for which a total bond issue of $4,000 000 was voted by the people at the November election. Inquiries at the office of State Engineer W. F. McClure brought out very little definite information. It is quite probable the engineering and architectural departments of the state will design the Sacramento buildings, while the San Francisco building may be open to competition. This would please the San Francisco architects very much, and a petition to this end has been circulated. As the building is to be erected in the new Civic Center, it will, of course, be necessary for whoever does the work to keep the design in harmony with the other structures already erected and to be built there. Officials of the State engineering department have volunteered the information that nothing will be done about the plans for any of the buildings until the entire bond issue has been sold. Petitions, asking for a competition for the San Francisco building, have been circulated and generously signed.

* * *

American Institute of Architects to Design Bridges

The American Institute of Architects, through its president, R. Clipston Sturgis, of Washington, D. C., has offered to the Lincoln Highway Association its services in designing appropriate arches, bridges and tablets for use along the route. This patriotic offer has been accepted by the association as being of inestimable value in securing designs of a uniform character from the best minds of the architectural profession of America. Competitions will be held between members of the Institute.

Wealthy men who have been patriotically considering the erecting of memorial tablets or arches along this route will be enabled to secure through the Institute of Architects the best that the nation has to offer in design.

Notes on Effect of Earthquake Shock on Buildings

By OCTAVIUS MORGAN, Fellow A. I. A.*

HAVING no other paper to put before you, I have been asked to talk a little on Messina. It seemed very timely, in view of the late earthquake in Italy.

One of my reasons for visiting Sicily, in addition to looking up lemon culture, was to satisfy my mind of the reasons for the great loss of life by reason of earthquakes in Sicily and Italy by the destruction of buildings.

You remember we had a quite serious earthquake on this coast some eight years ago. I was in San Francisco at the time of the fire and before the effects of the earthquake were obliterated. I about came to the conclusion that a well-constructed building, even of brick or stone was not subject to total destruction by an earthquake shock, unless of much greater severity than that of 1906. I have concluded that the loss of buildings at Palo Alto was largely due to very ill-advised construction.

Getting back to Messina. I arrived there about nine in the morning, hired a native light carriage, and with my courier took a very thorough view of the city that was. I was surprised to see how little had been done, beyond clearing the streets, toward the rebuilding of the city. San Francisco was in better condition ninety days after its destruction than Messina was four years after. Apparently the destruction was so total, the loss of life so great among its citizens of all classes, that new blood had to be brought in to make a new start. When I was told that ninety-five thousand out of a population of one hundred twenty thousand has been destroyed, I began to realize the reason for the slowness in the rebuilding of the city.

As you know, the American people subscribed a large sum of relief money, and also a great many ready-made frame houses were shipped, in their knock-down state—enough of them that they were enabled to house some eight or ten thousand people. And this today is called the American City, the streets being named after American admirals and other prominent citizens. The only hotel of any import at this time in Messina is a two-story, frame, rambling hotel, such as we might erect at the seaside. When I stopped here it seemed very familiar to me. This new town is laid out with wide streets, and apparently it will be developed into a new Messina with good buildings. They have already opened up a wide and straight street, well-paved, near and parallel to the old town, and it is being lined at this time with one-story business houses, and down toward the harbor a number of large reinforced concrete warehouses and business houses are in the course of erection. It seems simpler and easier to reconstruct a new town on a new site than to clear up the ruins of the old city, except along on the water front.

Now, we understand why the property owners of San Francisco showed such energy in the reconstruction of the city on its old lines. You can imagine the enormous destruction of values in real estate if the city had been permitted to move to a new site or to Oakland, as an effort was made by some to do.

In my saunterings amidst the Messina ruins, I had ample opportunity to observe the construction of the old buildings. The building that suffered perhaps the least in the earthquake was the opera house. The buttresses, the galleries, and the heavy roof trusses had apparently kept the walls tied together, preventing their collapsing inwardly or outwardly, the end walls being the only ones that were thrown down and out. It being a more modern structure was fairly well anchored.

You know the general construction of all the old buildings was of stone,

* Of Morgan, Walls & Morgan, Architects, Van Nuys Bldg., Los Angeles. Paper read before the Southern California Chapter, American Institute of Architects, February 9, 1915.

with but little wood used. The floors were generally vaulted—some very flat. The masonry was often rubble work, and where a squared stone was used little attention was paid to bonding them together. Now it was plain to be the reason of the total destruction and enormous loss of life. The streets of Messina, as in nearly all other Sicilian, Italian and old Spanish cities, were very narrow. There was little wheel traffic at the time they were founded, it being in the good old days of the pack animal. Imagine what happened when the shocks of the earthquake came. The walls went out, the domed floors came down, catching all those who were in the building under the floors, and all those who had rushed to the streets under the walls that had fallen outward. When I had before me the narrow streets, and the construction of the buildings, my mind was clear why the loss of life was so enormous. I had previously thought that fire might have had something to do with the loss. But no. Little timber was used in construction. It was only in a few of the mercantile structures, where the contents furnished the fuel for the fire, that damage to amount to anything was caused by that means. The method of the stone construction, and the almost entire lack of anchors, either metal or wood, was, together with the narrow streets, the real reason for the total destruction of the city, and enormous loss of life.

I was taken to the barracks. There was a total ruin! I was told that 75 per cent of the four or five thousands of soldiers staying there at that time were lost in the ruins. Round and round I went, and wondered anyone was saved who happened to be in the districts where the destruction was so great.

It was pitiful to see the fountains and monuments, with their beautiful carvings, surrounded by such utter chaos—ruin. These monuments, fountains and other pieces of sculpture were in great number, and very beautiful. But you all, without doubt, have seen illustrations of them, and it is not necessary for me to dwell on them.

When I got on higher ground and looked across the strait, my mind could but dwell on history. Scylla and Charybdis were before me. The current was swift. The line of surf covering the rocks made me realize the terrors of this strait in the days of the galley and clumsy sailing ships of 2500 years ago. Even today, the current is so swift at certain stages of the tide that it needs a good steamer to make the passage.

When I have picked up the papers during the last few weeks and have read of the losses through earthquake shock, all has seemed plain to me, and rather a matter of course. These losses were unavoidable in cities or villages planned with such narrow streets, and lined with stone buildings of such poor construction. Man, in Sicily, in Italy, is more gregarious than anywhere else. Their towns are like prairie dog villages. It matters not how small the village or how large the city, all houses are huddled and crowded together against all reason of proportion, convenience and sanitation, and apparently if there is a level piece of ground equally convenient, they will seek a hill or mountain side and pile one house above the other, even like a lot of cliff dwellers. When we think, there is a reason for this. In the good old days there were pirates, land pirates and sea pirates, and in union was strength and safety.

It is wonderful how these people hold to old locations. When an earthquake has destroyed the town, they will rebuild it in exactly the same spot, with the houses on the same sites. I presume it is the climate and the soil. These people are content with a living. A few acres will give them a little wine, a little corn, a few beans, a few olives. This is all they need, and the even climate makes them require little either in the way of clothing or fuel. The only fuel they use is a few handfuls of brush or a little charcoal. This is even made from limbs of trees that apparently were not more than an inch or so in diameter. All the timber having been stripped from Sicily thousands of years

ago, except on the slopes of Etna, the only trees left today are fruit trees. Soil is too precious to be wasted to raise anything but food-producing trees.

Talking of soil brings to my mind many a view of the peasants, women and children, gathering soil between the rocks on the mountain side, in baskets which they placed on their heads and packed to their terraced homes, to furnish soil in which they could plant an olive or some other fruit tree.

I spent a day and a half in Messina, and about 2 o'clock started for Palermo. Truly, this was a beautiful ride, following the sinuous lines of the coast. I was very sorry when darkness came on, about an hour before reaching Palermo—which is another story.

Sicily was truly the most interesting point on my trip. I spent two weeks there, and, much as I have read, it was a new book to me. The sterile, barren, sulphur mountains and valleys of the interior are the best exemplification of desolation that one could imagine. You are not surprised that there are brigands in that land, for the only money that could be in that country must come from the outside. It is true, on the coast line there are fertile valleys, some of them quite extensive, and these were the sites of those old Grecian cities, the ruins of the temples in which are so well preserved and interesting. I was reading the other day that some of these temples are as old as those of Athens, which you know were built with the wealth acquired by the plunder of the camps of Xerxes. These temples in Sicily were built from plunder of the camps of Hamilcar, the Carthaginian. So, you see, war as well as commerce has produced the greatest rewards to the architect, the victor spending the spoils of war in self-glorification in beautiful buildings. That is, a man is more free to spend the spoils of war than that which he has earned by the sweat of his brow.

* * *

Marks in Wood Record Heavy Wind Storms

LITTLE diagonal streaks or wrinkles across the grain of a piece of timber not only betray weakness, but sometimes indicate periods of stress through which the wood passed when it was growing. They may even be taken as a sort of check on the official record of wind storms, as in the case of some lumber tested at the forest service laboratory at Madison, Wisconsin.

The marks are caused by what are called "compression failures," which occur when the fibers bend or buckle under a too heavy strain. In cutting up logs collected for experiments at the laboratory, it was noticed that these compression failures appeared on the north side of a number of trees which came from the same locality in Florida. By counting the annual rings of the wood and from knowledge of the time when it was cut in the forest, it was decided that the compression failures must have been caused by a severe wind from the south about the year 1898. Inquiries were made in Florida and it was found that a hurricane had, in fact, swept over the region at the time indicated.

The experiments have determined that the strength of a piece of wood may be seriously impaired by slight compression failures due to rough handling. Dropping a beam across a skid may cause a compression failure at the point at which the beam strikes the skid and it will be at this point that the beam gives way when it breaks under a strain too severe for the weakened fibers to withstand. Hitherto unaccountable breakage in hickory wagon spokes and other presumably strong material are now attributed to compression failures caused by wind storms in the period of growth or by hard usage in lumbering and manufacturing processes.

Economic Waste of Architectural Competitions*

By J. E. ALLISON, A. I. A.

"THE profession of architecture calls for men of the highest integrity, business capacity and artistic ability. The architect is intrusted with financial undertakings in which his honesty of purpose must be above suspicion; he acts as professional adviser to his client and his advice must be absolutely disinterested; he is charged with the exercise of judicial functions as between client and contractors and must act with entire impartiality; he has moral responsibilities to his professional associates and subordinates; finally, he is engaged in a profession which carries with it grave responsibilities to the public. These duties and responsibilities can not be properly discharged unless his motives conduct and ability are such as to command respect and confidence."

The American Institute of Architects, the recognized official society of the profession, seeking to maintain a high standard of practice and conduct on the part of its members as a safeguard of the important financial, technical and aesthetic interests intrusted to them, offers advice relative to architectural competitions resultant from many years of experience and observation as to cause and effect as follows:

"A competition, when properly conducted, is a means of selecting an architect. As an incident, a good preliminary scheme may sometimes be obtained, but the Institute is of the opinion that competitions are in the main of no advantage to the owners. It therefore recommends that, except in cases in which competitions are unavoidable, an architect be employed upon the sole basis of iiis fitness for the work."

The profession, of course, concedes to the owner, who holds the purse, the right to select an architect by competition if he chooses to do so, and to the end that the interests of both owner and architect may best be conserved when competition is desired, has prescribed a method of conducting them which is fair and equitable to both, and which, if followed, will attract and interest many of the ablest men in the profession.

A competition even when properly conducted is somewhat tedious and expensive, and for small buildings, say $100,000 or less, is considered altogether too cumbersome for the advantages it affords.

It requires that the owner shall select and employ an expert advisor to prepare a programme of competition setting forth all of its conditions and including at least the following essentials:

(a) A contract between owners and competitors with reference to the judgment and award.

(b) Provision for the qualifying of all competitors who shall participate, as to training, experience and fitness, to execute the work if selected.

(c) A jury of experts to assist the advisor and owners in judging the relative merits of the designs submitted.

(d) A maximum limit for the cubical contents of the building determined by the limit of cost.

(e) Absolute anonimity as regards the identity of the authors of the designs.

(f) Proper remuneration for those architects who shall give of their time and thought for the benefit of the owner, and such other provisions as are set forth in the Circular of Advice of the American Institute of Architects.

With all of these conditions properly met, and the verdict still remaining "that competitions are in the main of no advantage to the owners," how much of an actual detriment and disadvantage must they be under conditions that

* This article refers more particularly to school competitions as conducted in Southern California, and is part of an address delivered by Mr. Allison before the Los Angeles School Board.

obtain in many of the so-called competitions as conducted all about us here in Southern California and in which many architects continue to participate, and to even scramble for the opportunity of so doing.

These so-called competitions include no such provisions as above mentioned for safeguarding the interests of either owner or architect; no professional advisor, no adequate programme, no binding contract, no jury, no anonimity, no remuneration except for the one selected. On the contrary, the invitations usually read, and somewhat reassuringly, "the board reserves the right to reject any or all plans and specifications submitted," and "the board will not pay for any of the designs submitted except the one that may be adopted," and in fact does not agree to adopt any of the designs submitted unless they see fit; finally "they will pay five per cent, or less, for full service including supervision, to the architect whose plans and specifications may be selected," while six per cent is the recognized minimum fee charged for first-class architectural service everywhere.

This condition of affairs is greatly to be regretted as having a directly demoralizing effect upon the architecture of our public buildings, and also upon the status of our profession in the eyes of the public. Nevertheless, it can not be denied that the profession (or rather those members of the profession who indulge in such competitions) is largely responsible with the owner for these conditions, because such members do not exercise their prerogative forcefully and diplomatically in informing the usually inexperienced owner of the evils of this system, and because when their advice is sought and given, and in the end disregarded by the owners, these architects very often, by subsequently entering the competitions, weaken their position and eventually lose the respect and confidence of the owner both for themselves and for what they are supposed to stand. Furthermore, these architects evidently do not very carefully count the cost of this system to their professional reputation or its resultant effect upon the aesthetic value of their finished work, elements large as a determinig factor for ultimate success or failure, nor do they count the cost to the owner who actually employs them.

A little analytical reflection on the part of the architect from this angle as regards himself and his work, and a little mathematical calculation on behalf of the owner should convince him that it is a losing game for both, for the owner pays the entire cost of such a competition, and very often a great deal more; but not however to the architect whom he thus employs.

To demonstrate just how this operates, let me cite you a typical example:

We will select out of the many school buildings being erected from plans procured by this competitive system, say ten high schools costing $100,000 per, for each of which ten architects compete, this number being perhaps a fair average, although I am told that in a recent competition for a $30,000 school twenty per cent of plans were submitted by as many architects.

The apportionment of the entire fee for preliminary sketches made by the American Institute of Architects is one per cent of the cost of the building, but to give the owners the full benefit of any doubt that may exist as to the actual cost of such competitive sketches, we will assume that the cost of each of the ten competitions to each of the ten competitors is one-fourth of one per cent, or $250 each; or $2500 for the ten competitions.

By equitable good fortune each of the ten competitors, we will say, is successful in being selected for one building, which might be fair and would not deprive any brother architect of his share. Is it not a fact that each of these ten competitors has, in due course, spent in order to win his one building $2500 or one-half of the entire 5 per cent fee which he will receive for full service? If so, he is confronted with the fact that out of the remaining 2½ per cent of

his fee he must not only execute the entire work with that high degree of proficiency expected for the owner, and with due credit for himself, but he must also have at least living profit.

Statistics have proven that in the best managed architects' offices the minimum cost of producing proper working plans and specifications is from 2½ to 3½ per cent of the cost of the building, to say nothing of the full-sized detail drawings and supervision of construction. It goes without saying therefore, that the architect who has thus spent half of the fee in winning the job, must of necessity minimize in the work and curtail the study given to the plans, specifications and details in order to avoid actual loss to himself. And what is the result? Incomplete data, shortages, ambiguities, discrepancies, etc., resulting invariably in high bidding by the contractors, plus innumerable disputes, misunderstandings, extras, law suits and various other griefs incident to cheap architectural service; and last, but not least, when the building is finished he has a structure that is below par in quality, design and appointment, and at an excess cost ranging from 5 to 15, and sometimes 20 per cent of its total cost.

Right here is where you pay for the whole cost of the so-called competitive system in dollars and cents and otherwise, and your building usually stands for a long time to remind you of how it happened.

* * *

Panama Canal Counts

PHILADELPHIA business men are beginning to feel the benefits of the Panama canal, says the traffic editor of the Public Ledger. For a number of months there has been an increase in business between this port and the Pacific Coast. This was first noticed in the large increase of dried and canned fruits and wine.

Business from the Pacific Coast is expected to be rapidly increasing in tonnage by heavy shipments of California magnesite and kaolin. In the past virtually all of the magnesite and china clay used in the eastern and middle states has been imported, the bulk of the magnesite coming from Austria and most of the clay from England. Although there are large deposits of both materials in California, it was not profitable to ship to the Atlantic states because of the high rail charges.

Both of these American products are superior to the foreign products, and, with the all-water haul, they can be landed in Philadelphia cheaper than they can be imported. Two experts on magnesite have pronounced the California article superior to any in the world.

In speaking of the kaolin, another expert said that last year about 250,000 tons of this product were imported for use in pottery, paint and chemical plants.

* * *

Plants and Flowers from European Countries

Shipments of rare unnamed roses and other plants have been made from Luxemburg, France and Great Britain to be entered for the $1,000 prize offered by the Panama-Pacific International Exposition for the most perfect new variety of rose. The seven commissioners of the Netherlands government to the exposition report that they have assembled from all of the principal cities of Holland the most extensive horticultural exhibit ever sent to America from a foreign country. Many rare bulbs have already reached the Exposition grounds from Holland.

Suggestions for Light Concrete Floor Construction in the Concrete House

By MILTON DANA MORRILL, Architect, in Concrete-Cement Age.

IN a $600,000 residence lately put up on Long Island, N. Y., the builder, a man of progressive fiber, wishing to give a better construction than was called for by the plans, offered to put in a fireproof interior, including reinforced concrete floors and partitions, at the comparatively small additional cost of $600.

The owner, however, did not appreciate the value of having his house fireproof, and did not accept the offer, and this fine home was built, as is the custom, with a mass of dry pitch-pine lumber put together like a tinder-box, only needing the smallest spark to start the blaze which in a few minutes' time could destroy not only the fine house with its priceless antique furnishings, but might prove a great hazard to the members of the family, who might be entombed therein.

This illustrates the fact that the public, as a rule, does not today realize in the smallest way the worth and value of proper construction, and "they know not what they build."

There may still be an excuse for frame construction in the cheapest and most temporary dwellings, but if the home owner realized the advantage and added protection offered his family through the use of a permanent fireproof type of building, progress would be much more rapid and safe and sane construction would be the universal order of the day.

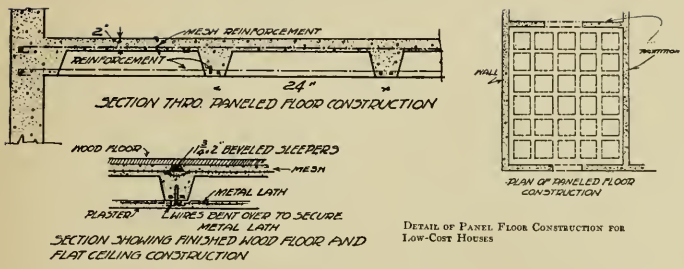
Little by little headway is gained and masonry and fireproof walls are taking the place of frame, but sight is being lost of the most vital part of the house, the floor construction.

In several instances in concrete houses the entire frame interior has been gutted by fire, leaving the walls standing structurally uninjured and ready for rebuilding and re-use.

While this is a test which no other form of construction ordinarily outlives, and shows reinforced concrete as the superior wall construction, it also shows that only so far as a house is concrete is it fireproof, and it shows further that if concrete is good for walls it is still better and more valuable for floors and partitions. There its use will effectively block any general conflagration and confine any small fire to the floor or the apartment of its origin.

In houses a much lighter reinforced concrete construction can be employed than is used in other buildings. The architect or builder is likely to consider reinforced concrete from the masonry standpoint and is, therefore, inclined toward thick walls and heavy beamed floors. But counting inch for inch of structural section, reinforced concrete is a stronger building material than wood, and in the average house spans a reinforced slab four inches thick is more than equivalent to the floor built up with ten-inch wood joists, and the four-inch reinforced partition is far more substantial than the six-inch in thickness made up of studding, lath and plaster.

The ideal floor slab for light construction is of the flat or paneled type, with a light basket weave of wire, secured and supported on four sides, with just enough concrete for stiffening. The strength of such a slab is remarkable and far in excess of the tabulated strength generally credited to it. This was brought forcefully to the writer's attention during the construction of the forty concrete houses in the Nanticoke group, and in the tests there employed, and further in the eight concrete houses built near Montreal by the Canada Cement Company, where 4-inch slabs on 12-foot spans were used, and wood sleepers, 1¾ inches in depth were bedded in these slabs, giving a structural



Detail of Panel Floor Construction for Low-Cost Houses

slab of only 2¼ inches in thickness; yet these thin slabs were much more firm and substantial than are the usual wooden floors.

The average builder would hesitate to employ such construction and would question its stability. But the proof is there, where any one may see.

A suggestion is here given (see accompanying sketches) for a hollow paneled floor slab which might be used with considerable advantage in house building. It is intended to be constructed over inverted steel box forms, so shaped that they may be easily removed and used over and over again. The lightness and general substantial character of such a slab are apparent and need little comment or description. The sleepers are bedded in the members, 3′ o. c., forming the panels. Metal lath and plaster are to be applied on the under side of these panels.

* * *

Coming Convention will Interest Coast Architects

By CHARLES S. KAISER, A. I. A.

THE attention of architects is called to the coming meeting of the American School Hygiene Association, which is to be held in San Francisco June 25th and 26th, under the patronage of the Panama-Pacific International Exposition. The educational exhibit of the Exposition is itself very comprehensive and interesting, and it is planned to supplement this with an exhibit of the most progressive and hygienic types among the schools of California.

This will be the eighth congress of the national association, last year's meeting having been postponed on account of the war. The congress of 1913, it will be recalled, was merged into the Fourth International Congress on School Hygiene, very successfully held at Buffalo.

Further announcement will be made as soon as the programme of this coming congress has taken more definite shape, but it is to be expected that the papers and discussions will have the same great practical value as those that appear in the proceedings of former congresses.

It is hoped to place the importance of the hygiene movement as represented in this congress of the American School Hygiene Association strongly before all those who are responsible for health conditions in our public schools. Among these responsible people the architects of the country certainly have a great deal to answer for. Every architect with the remotest interest in schools should become a member of this congress and study its proceedings, whether expecting to attend or not. Dr. Wm. Palmer Lucas is secretary-treasurer.

The Swaying of Tall Buildings

THE city of Chicago, built as it is on substrata of clay, furnishes the most interesting study of the movement of buildings, and the greatest number and variety of examples. All of the early skyscrapers of that city were carried on floating foundations or on piles driven deep into the clay. These buildings without exception settled into the soil due to their weight, the distances they settled varying from three to over five inches. Many of these buildings, notably the Great Northern Hotel, are partially carried on jacks and periodically levelled up as settlements occur, then, after all subsidence has taken place, and the buildings have finally come to rest, the jacks are removed and the foundation walls filled in with masonry.

That is one of the movements of buildings, then, settlement; but settlement takes place only in those buildings erected on floating foundations. When the footings are extended down to bed rock, as all footings for present day buildings in Chicago are, the amount of settlement that takes place is nil and may be disregarded.

But even buildings with their footings carried to bed rock lean or are racked out of plumb, and the taller the buildings the more they are likely to lean, although the amount they are out of plumb is seldom enough to endanger the structure. Recently the Unity building at Chicago was straightened, being considered "unsafe, but not dangerous," at thirty inches out of plumb. It is impossible to prevent the big buildings from leaning. Some of them are not straight when they are finished, but that does not impair their safety, and it is probably safe to say that every building in Chicago leans more or less. If they are on floating foundations they also settle gradually. But there is still another movement of buildings, and the most interesting of them all to consider. For instance, the Eiffel tower swings perceptibly in the wind, and even stone shafts like those of the Bunker Hill and Washington monuments move several inches at the top. The side that is towards the sun expands during the day more than the side in shadow.

An interesting device has been employed to show the movement of the dome of the capitol at Washington. A wire was hung from the middle of the dome inside the building down to the floor of the rotunda, and on the lower end of the wire was hung a 25-pound plumb bob. In the lower point of the weight was inserted a lead pencil, the point of which just touched the floor. A large sheet of paper was spread out beneath it. As the dome moved, it dragged the pencil over the paper every day. The mark made was in the form of an ellipse six inches long. The dome would start moving in the morning as soon as the rays of the sun began to act upon it; and slowly, as the day advanced, the pencil would be dragged in a curve across the paper until sundown, when a reaction would take place and the pencil would move back to its starting point. But it would not go back over its own penciled track, for the cool air of night would cause the dome to contract as much on the one side as the sun had made it expand on the other, and so the pencil would form the other half of the ellipse, getting back to the original point all ready to start out again by sunrise.

In the three movements affecting tall and heavy buildings we have, then, particularly in the expansion and contraction movement which is of daily occurrence, and which affects skyscraper buildings as well as all other tall structures, a condition which must be taken into consideration when planning the buildings. Lines of steam pipes, stocks of draining pipes, lengths of water pipes, vacuum cleaning pipes, refrigeration system pipes, electric wire conduits and the various networks of tubing which cross and criss cross inside of a building will naturally be more or less affected by

the movements of the building; and if long life is expected of these various systems of piping, they must be so installed that they can "give" under the movements of the building without damage to the piping, and sufficient to compensate for the change of position.

Besides pointing out the necessity for flexibility for the piping systems in tall buildings, the movement of buildings shows how desirable it is to have solid foundations, the footings of which extend down to bed rock. Floating foundations are all right for some kinds of buildings, but for the skyscraper type there is nothing so good as the solid rock of old Mother Earth.

* * *

California's Architectural Contribution

From The School Board Journal.

WITH originality and boldness, characteristic of their native state, California architects have recently developed two distinctly valuable forms, or types, of school buildings. The older, and more common, is the one-story elementary building, built around a central court, and resembling the old Spanish buildings which date from the early mission days. The second type is the group high school, in which each distinct set of studies is housed in a separate structure, suited to the specific needs.

The typical California "mission" school house is nearly ideal for the climatic conditions of the state. The open cloisters afford shelter from the glare and heat of the summer, and protection against the rain and wind of the winter. At the same time, they allow plenty of fresh air under all conditions. The one-story buildings afford a minimum expense for construction and maintenance, and a maximum of safety against fire, panics and other dangers found in the compactly built school houses of the eastern states. Except for the greater ground area which they occupy—an objection that has no weight except in large cities—the mission type school has hardly a fault worth mentioning.

The group high school has been found in California to be the most economical, flexible, adaptable type of building devised thus far. Usually it is begun with a single unit that provides accommodations for the administrative offices and for academic class rooms. Buildings for manual arts, natural sciences, household arts, physical education, assembly, etc., are added as the needs arise, as the student body increases and as the financial ability of the district permits. Each group of studies has a structure exactly planned for its use. There is no interference or disturbance of departments, and the whole is held together as a school by the principal and his assistants. Architecturally the group becomes a civic and social center, each building expressing its purpose unmistakably and contributing to the unity and beauty of the whole.

While these two California types of school houses may not be adapted for use in many states of the union, they emphasize the need of original thinking in school house planning. They make evident by comparison the failure of the south, of the southern states of the north central group, and of the mountain states to study the problems of housing the local schools in structures characteristic of the country, adapted to the climate and the native conditions.

There is a very real need in American school architecture for less imitation and less following of precedent. More vigorous, independent and bold initiative, applied with due consideration of proven principles is essential, if we are to have, in every section of the United States, a true, characteristic school architecture.

The Protection of Stone Work

MANY architects are opposed to the use of stone because of its discoloration, due to dripping of dirty water, iron rust and verdigris from copper and bronze. Those who have followed the stone contracting business say that with a little care a stone building can be kept as clean as a brick or terra cotta one.

The specifications for stonework may be prepared with great care, calling for stone of the highest grade, of uniform color, free from sap, stains, knots, "niggerheads," shakes, or other defects, to be coated with waterproof paint on backs, beds and joints, and to be set in non-staining cement. But how often do the specifications contain a single reference to the care of the stone from the time it leaves the mill until it is set in the wall? It is the rule rather than the exception to find beautiful cut stone work dumped on the ground promiscuously and left to absorb the moisture from the dirt, to be covered with soot, and to be trampled on by workmen and others around the building. It may even get drippings of oil or other liquids that penetrate deep into the pores of the stone. If stone that has been so abused goes into the wall it is next to impossible to use any methods of cleaning to restore its original beautiful color. If it were not that the precaution is so frequently neglected, it would hardly seem necessary to say that all cut stone delivered to the building site which is not immediately to be used should be piled on boards that are raised a few inches from the ground, and thoroughly covered with tarpaulin, waterproof paper, or in some other way.

Architects are inclined to pay far too little attention to damp courses at grade. Probably every one has noted the appearance of otherwise beautiful stone buildings marred by reason of the fact that no damp courses, or because imperfect damp courses, had been provided at the grade line. The result of this is that moisture from the foundation and dirt carelessly thrown up against the bottom course of stone is absorbed by the stone, which becomes discolored and unsightly. This lack of protection assumes a greater importance where the soils contain alkalies, for these salts are drawn up by capillarity, and evaporating on the surface leave a skin or efflorescence that is very disfiguring.

Far too little attention is also paid to proper provision for the carrying off of water from stone work. This is especially true of porticoes and flights of steps. In projecting overhead work the water is allowed to seep down from the courses of stone work and consequently they are almost continually water soaked, discolored, and a condition favorable to disintegration and decay is present. Many architects fail to provide reasonably adequate drips under projecting courses, with the result that the water washes the dirt and soot down over the face of the wall. With the increased popularity of rubbed and tooled surfaces for stone work, it is not uncommon to see the entire fronts of immense buildings with not a single projection from the cornice to the water table, even the sills and lintels being set flush with the wall. The result of this is that the moisture gathering in the window spaces is not thrown off by the wash and drip of the sills, but runs down the face of the wall, so that there are regular spaces of staining between each floor.

It is interesting to consider what may be the reason for this lack of protection from weather conditions. Probably it is due to the interest in Classical and Renaissance architecture. The builders who wrought in these styles did not have severe weather conditions to meet, as a rule. The structures went up in a warm and dry climate and even the most delicate

stone held its color and texture. The Gothic builders on the contrary, had to confront frost and moisture, and it was necessary for them to guard against the ravages of the elements. In the Gothic buildings, drips are provided wherever necessary, and there are constant provisions for carrying the water from rain or snow far from the walls. The matter is one of great importance, and it is one to which the architects might well give more attention.

* * *

An Exhibition Catalogue

ARCHITECT HENRY A. SCHULZE sends us the following "Sing a Song o' Sixpence" taken from the American Architect of December 8, 1888, and which seems to fit in very well just now with the opening of the Panama-Pacific Exposition:

A correspondent of our contemporary, Fairplay, has unearthed a comic catalogue written in connection with the great exhibition of 1851. It certainly is rather entertaining.

I've had a private view of the exhibition book,
I mean the authorized catalogue, and from it straightway took
The names and numbers of curious things to see.
And curious you'll say they are, if you'll attend to me.

No. 1's A bucket of water taken from "All's well,"
No. 2's The coat that's worn by the Ocean's heavy swell,
No. 3's The weight exact of a grain of common sense,
No. 4's Some of the tar with which once Israel pitched their tents,
No. 5's A pat of butter, made from the cream of a joke,
No. 6's The tail of a pig that was got into a poke,
No. 7's The gingham queer that Louis Philippe did borrow,
No. 8's The saucer with which to match the cup of sorrow,
No. 9's The loaf from which the crumb of comfort fell,
No. 10's The brush that paints the signs of the times so well.
No. 11's The marrow from the bone of contention taken,
No. 12's The rasher of the man who saved his bacon,
No. 13's The strap that sharpens up the water's edge,
No. 14's The apple of the eye of faith, so they allege,
No. 15's The two original stools thro' which the chap was floored.
No. 16's The soap that washed the captain overboard,
No. 17's The nose cut off our noble country's face,
No. 18's The naughty gander caught in a wild goose chase,
No. 19's A splinter taken from the River Styx,
No. 20's From the house that Jack built, twenty bricks,
No. 21's The teeth from the Mississippi's mouth,
No. 22's A Scotchman who never traveled South,
No. 23's Some coins from the change of the moon, in pence.
No. 24's A link from the chain of evidence,
No. 25's The wheel of fortune, spokes and staves,
No. 26's The pen with which Britannia rules the waves,
No. 27's The baby's mouth that was born with a silver spoon,
No. 28's The swarm of bees that made the honey moon,
No. 29's The bow that shot the shaft of ridicule,
No. 30's A grammar from adversity's old school,
No. 31's The bit of steel that made the Iron Age,
No. 32's The livery worn by History's page,
No. 33's The rock to manufacture flinty hearts,
No. 34's The barb from one of wicked Cupid's darts,
No. 35's Some bits of daylight, picked up when morning broke.
No. 36's The cork that fits into the bottle of smoke.

I've sung in numbers, and of numbers up to thirty-six;
Success to Albert and the Queen, and all the little Vics;
With parting directions, my ditty shall be done,
But when you go to see the numbers, look out for number one.

THE
Architect and Engineer
OF CALIFORNIA

Published Monthly in the interests of the Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast by the Architect and Engineer Co.

BUSINESS OFFICE AND EDITORIAL ROOMS
617-619 Monadnock Building, San Francisco
Telephone Douglas 1828

TERMS OF SUBSCRIPTION
(Including postage) to all parts of the United States $1.50 per annum; to Canada 50c additional; to all Foreign points $1 additional.

Vol. XL. March, 1915 No. 3

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After many years of agitation, definite action for the betterment of conditions in the building industry has been taken. At the annual meeting of the National Association of Builders' Exchanges held recently in Columbus, Ohio, a report was submitted outlining the conclusions reached by the joint committees of the exchanges and the American Institute of Architects. Many improvements in existing conditions were recommended, final decision on which will be taken at a conference with the architects at an early date.

IMPROVEMENT OF BUILDING CONDITIONS

The necessity for an improvement in present conditions is evident. A more equitable method of settling disputes between the contractor, the architect and the owner is needed; reforms in the methods of awarding contracts and the ethics governing estimating and bidding are desirable. With a uniform system of general conditions for building contracts, the contractor can conduct his business on a safer and saner basis.

Architect R. A. Herold of Sacramento has entered a protest with San Francisco Chapter, A. I. A., against Messrs. Shea & Lofquist being awarded the work on the new Sacramento Hall of Justice. Herold claims he held out for the Institute's fee of 6 per cent and that Messrs. Shea & Lofquist, with other architects, offered to do the work for less. The successful architects claim that they are merely acting as a Consulting Board, the same as Messrs. Howard, Meyer and Reed are acting for the city of San Francisco, and that the actual plans have already been drawn for the building. Their task, they say, will be mainly to revise the drawings and superintend the work of construction.

A FINE POINT FOR THE CHAPTER TO RULE UPON

For this they argue the regulation 6 per cent should not be charged. The Chapter has received a report on the matter from a special investigating

committee, of which Mr. Martin of Los Angeles Chapter is the chairman. A report has been requested from Messrs. Shea & Lofquist, and until these reports have been submitted no action will be taken.

WOMEN ARCHITECTS WIN FIRST PRIZE

A firm composed of two New York women architects, Schenck & Mead, has been awarded the first prize in a Chicago City club competition for plans for a neighborhood center in any city. The place selected was a square mile of the Bronx, and within this district were planned parks, a library, schools, a ball room, "movies," etc.

The incident is doubly significant of the extraordinary interest in neighborhood interests and of the peculiar fitness of women to deal with them.

CREATIONS IN BRICK

The brick court in the Palace of Varied Industries at the Panama-Pacific International Exposition at San Francisco is one of the interesting objectives of the daily sightseeing pilgrimages which include this exhibit palace in their itinerary.

Pausing at this place, the thousands of visitors from far and near behold a revelation of the artistic possibilities that lie in the combination of bricks of varied finishes and colors, besides seeing a practical exhibit of the various structural features of a house that can be built from brick giving the satisfactory, composite result of substantiality, comfort and pleasing appearance.

The entire floor, the three walls, the fireplace in the background with its mantel and hearth, the four corner columns of the structure, and an ornamental column in the foreground are all creations in brick of varied styles, colors and patterns.

The walls are the result of a continuation of panels, each distinctive in color and pattern and made of brick in every instance, but are united according to a plan that makes a harmonious, artistic, general effect. Suggesting the appropriate style of roofing for a building of this character, eaves of red tiling are used.

OFFICIAL MINUTES OF SAN FRANCISCO CHAPTER, A. I. A.

Commencing with this issue the Architect and Engineer will publish each month the official minutes of all regular and special meetings of San Francisco Chapter, American Institute of Architects.

Emil de Neuf

Emil de Neuf, formerly San Francisco city architect, and head draughtsman for Architect G. A. Lansburgh of San Francisco, was killed March 14th by a fall from the fourth floor of an unfinished building at 726 Sutter street, San Francisco. His body was lying on the concrete pavement of a rear court, and was found by Mathew White, a carpenter. The police were unable to discover how De Neuf came to fall.

De Neuf served a short time as city architect five years ago, succeeding Loring P. Rixford. He was 43 years of age and leaves a wife, two sons, and a daughter.

Granted Certificates to Practice

The following have been granted certificates to practice by the Northern District Board of the California State Board of Architecture:

Ralph W. Armitage, 500 Clunie building, San Francisco; Leland A. Bryant, 37 San Jose avenue, San Francisco; William F. Bowen, Fresno; James H. Mitchell, 717 Clayton street, San Francisco; Albert L. O'Brien, Clunie building, San Francisco, and Fred H. Reimers, 2125 Shattuck avenue, Berkeley.

San Francisco Architectural Club

Because of the great popularity of the present advanced class in Structural Engineering, now completing a successful year of its work under the leadership of Mr. R. S. Chew, the board of directors of the San Francisco Architectural Club announces the organization of an Elementary Class in Structural Engineering, under the same instructorship.

Big Chemical Plant

The Chemical Pigment Co. has been incorporated with a capital stock of $1,000,000. W. H. Covert, 810 Walnut avenue, Long Beach, one of the incorporators, has informed the Long Beach Chamber of Commerce that the company contemplates building a $250,000 plant for the manufacture of white lead.

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SEC'Y-TREAS....AUG. G. HEADMAN, San Francisco
Next Convention City—San Francisco.

Store Building

Architects Reid Bros. have made plans for a one-story Class C store building to be erected on Polk street, between Clay and Sacramento, San Francisco, for the Misses Allyne.

New Espee Depots

The engineering department of the Southern Pacific Co. is preparing working drawings for new passenger and freight depots for Modesto and Turlock. A contract for a new depot at Richmond recently has been let.

PRESIDENT - - - - - JOHN BAKEWELL, JR.
VICE-PRESIDENT - - - - CHARLES PETER WEEKS
SECRETARY AND TREASURER - - - WILLIAM OTIS RAIGUEL
DIRECTORS - - JOHN GALEN HOWARD and LOUIS C. MULLGARDT

COMMITTEES:—
Membership—WM. C. HAYS, FRED'K H. MEYER, and GEO. W. KELHAM.
Architectural Practice—JOHN GALEN HOWARD, CLARENCE R. WARD, and HOUGHTON SAWYER.
Entertainment and Program—LOUIS C. MULLGARDT, CHAS. P. WEEKS, and LOUIS P. HOBART.
Allied Arts—LORING P. RIXFORD, J. HARRY BLOHME, and WARREN C. PERRY.
Publicity—WM. OTIS RAIGUEL, JOHN J. DONOVAN, and E. COXHEAD.
Education—BERNARD R. MAYBECK, ARTHUR BROWN, JR., and JOHN BAUR.
Competitions—CHAS. P. WEEKS, WM. C. HAYS, and JOHN REID, JR.

San Francisco Society of Architects February Meeting

THE regular monthly meeting of the San Francisco Society of Architects was held at the University Club, California and Powell streets, on the evening of February 10th, with a good attendance of members, and as guests: Mr. O'Shaughnessy, the city engineer; Mr. Henry Hornbostel of New York, Colonel Hetherington, representing the state of Pennsylvania at the Exposition; Mr. Trumbull, the artist who executed the mural paintings for the Pennsylvania building, and Mr. Stafford L. Jory.

The evening was devoted to a continuation of the discussion of "The Development of the Foot of Market Street." Mr. O'Shaughnessy gave an extremely interesting talk on the subject, illustrated with a number of plans which had been made by him as suggestions for remedying the present intolerable conditions. He also showed a number of photographs of similar work which had been done in European cities to accommodate traffic conditions and embellish the water fronts. Beginning with the first laying out of San Francisco in 1849 when it was a village of about 300 inhabitants, and covering about 100 acres, he outlined the history of the growth and development of the city and its street traffic, bringing the subject down to the present day with all the complexities and difficulties which have far outstripped the facilities for handling them. He went over the manifest difficulties attendant on any project, calling for the coöperation of the state as the owner of the San Francisco water front, the municipality and the United Railroads, but laid particular stress on the vital importance of the whole problem and expressed the hope that the society and the architectural profession in San Francisco would interest themselves in its solution.

A general discussion and presentation of several schemes followed.

A unanimous vote of thanks was tendered Mr. O'Shaughnessy for his contribution to the evening's discussion.

The chair announced that the business of the next meeting would consist of the execution of the articles of incorporation of the society.

Stockton Moose and Hotel Buildings

It now seems quite probable that a large hotel will be erected next to the Moose building on South San Joaquin street, Stockton, from plans by Architect Glenn Allen of San Francisco. The total frontage will be 100 feet, and there will be a common entrance to both buildings, also elevator service and stairways. Each building will be five stories in height. The Moose will own their own structure and H. E. Williamson will own the other building. Construction will be Class C.

Architect's Office Abolished

The Oregon State Board of Control has abolished the office of State Architect, and will hereafter, when work is required to be done, employ W. C. Knighton, who has held the State office for the past four years. During that period he has supervised the construction of ninety buildings, having an aggregate value of $1,395,000. The expenses of the department have amounted to $42,000, or a little more than 3 per cent of the money expended.

Exposition Architects Honored

In a simple ceremony in the shadows of the massive colonnades of the Court of the Universe the Exposition directorate on February 25th paid tribute to the men whose creative genius has made possible the walled city of beauty in which the world is celebrating a great achievement. The men honored were architects, sculptors and others, and the day was designated as designers' day.

President Moore of the Exposition made the opening speech, in which he called attention to the fact that the creative genius that had builded expositions in the past had gone without public honor.

"This is the first time in the history of expositions that the men whose art and genius have been responsible for their creation have been duly honored," he said. "The courage and energy and devotion which the designers have shown throughout the long months from the very beginning until the hour of completion have won the admiration of all who have been thrown in close contact with the Exposition.

"This work is the triumph of art in exposition building. It is almost divine, and the good that this work will do for the people through the years to come will be far greater than we today realize."

George W. Kelham, chief of architecture, was then called upon to reply for the designers.

"We have found a sympathetic client in the Exposition," said Kelham. "This ceremony is but one brief link in a long span of endeavor which resulted in the finished Exposition. The last few months have been comparatively easy; the real hardships were in the beginning.

"'Why don't you make the dirt fly?' was the most frequently put query we heard on the street and elsewhere during the early months. If the people couldn't see an army of men at work here in these days, they thought that everything was all wrong, and even doubted whether or not the Exposition would be actually built. During the last few months, however, we have had everyone's support and it has been gratefully received.

"My only regret is that Guerin and Bacon and some of the others who have had their place in this work were not able to be here at this time to receive this honor along with the rest of us."

A bronze plaque, suitably engraved, was presented to each of the following designers:

George W. Kelham, W. B. Faville, L. C. Mullgardt, Arthur Brown, Jr., Clarence R. Ward, B. R. Maybeck, A. Stirling Calder, William R. Mead, Karl Bitter, Thomas Hastings, R. D. Farquhar, John McLaren, Henry Bacon, Jules Guerin and William R. Mead.

Two Oakland Residences

Architects Schimer & Bugbee, Dalziel building, Oakland, have designed a two-story and basement frame and plaster residence on Ashmont avenue, Crocker Highlands, Oakland, for Mrs. S. W. Shores. The house will have hardwood floors throughout, mahogany trim down stairs, two bathrooms finished in tile, automatic water heater, hot air furnace, brick entrance, etc. The same architects are preparing plans for a $20,000 residence at Rockridge.

Mission Architecture at the Exposition

(From the San Francisco Chronicle)

The use of the Mission style of architecture for exposition purposes was a subject of considerable discussion when the proposal was first made, but now that the California building is in full swing there are few structures which from both the outside and inside views are more admired. All fears that the interiors might prove too somber for the festival spirit have been found groundless. There is the happiest possible combination of reverential restfulness in the outlines and California industries in the exhibits.

Architectural Competition

The Los Angeles City Planning Association has adopted a resolution approving the plan of President Whiffen of the City Council to institute an architectural competition for plans for the development of the Normal School property which now belongs to the city. Prizes will be offered to the competitors submitting plans. The City Planning Association has offered in the resolution to co-operate with President Whiffen in arranging the details of the competition.

Fireproof Apartments

Architects Train & Williams of Los Angeles are preparing plans for a five-story and basement reinforced concrete apartment building to be erected on the corner of Orange Grove avenue and Elevado drive, Pasadena, for F. R. Kellogg Co., 521 Douglas building, Los Angeles. The structure will be in the shape of a letter H and will cover an area of 170 feet square and contain 196 rooms in suites of three, four and six rooms. Cost, $150,000.

Examination of Architectural Draftsmen

To fill positions with the California State Department of Engineering, the Board of State Harbor Commissioners and all other positions of the same class and grade, an examination will be held in Sacramento on March 27th. The salaries will range from $1200 to $1800 per annum. There is a great deal of prospective architectural work for the State which will require men of this class.

Honor for J. J. Donovan

City Architect J. J. Donovan will be the first speaker in the Oakland Municipal auditorium on its completion. He has accepted an invitation from the National Educational Association to talk on the first day of the association's gathering in August. Donovan will speak on "School Grounds and School Architecture."

San Francisco General Contractors' Association

The new Board of Directors of the General Contractors' Association of San Francisco has elected the following officers for the ensuing year:

A. H. Bergstrom, president; Grant Fee, vice-president; Charles Wright, treasurer; William E. Hague, secretary.

Mr. Bergstrom, the new president, is a partner of the well known general contracting firm of Lange & Bergstrom, whose activities in the building business of San Francisco during the last eight years have placed them in the front rank as responsible builders.

The members of the new Board of Directors are as follows: A. H. Bergstrom, Grant Fee, Thos. B. Goodwin, Harvey A. Klyce, Chas. J. U. Koenig, William Linden, A. F. Lindgren, Ralph McLaren, Clarence M. Moore, E. T. Thurston, Charles Wright.

Former State Architect Weds.

W. D. Coates, Jr., former state architect, and Miss Edna Richardson of Fruitvale were married in San Francisco February 20 by Rev. W. K. Guthrie of the First Presbyterian Church. Only members of the couple's family were present. Shortly after the wedding Mr. and Mrs. Coates left for a trip to Los Angeles and San Diego. They will reside in Fresno, where Mr. Coates is supervising architect of the new school buildings being erected there.

Apartment House

Architect A. W. Burgren of San Francisco has prepared plans for a four-story Class C apartment house to be erected on Geary street, near Hyde, San Francisco, at an estimated cost of $50,000. The building will be 50 x 137½ feet and will contain forty apartments of two and three rooms each. The proposition has been financed.

Building for City Delivery Co.

Architects Cunningham & Politeo of San Francisco have completed drawings for a two-story Class C loft building, to be erected at Eddy and Hyde streets, San Francisco, for the City Delivery Co., in which the Samuels Bros., formerly of the D. Samuels Lace House, are interested. The estimated cost is $25,000.

Pomona Apartment House

Architect C. E. Wolfe of Pomona has recently completed plans for a two-story store and apartment building to be built on Grand and Garey avenues, Pomona. There will be oak floors in the principal rooms, beam ceilings, etc. Peter Montano is the owner.

To Build Court House

Susanville, Lassen county, is planning to build a new court house at a cost of $100,000, and a county hospital to cost $20,000. The supervisors have passed a resolution to that effect and the taxpayers will be asked to vote the necessary bonds at an election to be called soon. The new board of supervisors is as follows: George W. McDow, chairman, Susanville; J. H. McClelland, Standish; George B. Levitt, Levitt; H. E. Wood, Berber; Willis Brockman, Madeline.

New Fresno Hotel

Construction has been started on the new Fulton hotel at Fresno to replace the building burned last summer. Structure will be two stories and basement, 50 x 150 feet, steel frame and brick walls, and will cost $30,000. The hotel will be owned by Mrs. Mary Fulton, and has already been leased by the Grand Central Hotel Co. R. L. Felcher is the architect.

$60,000 Residence

Architect Louis P. Hobart has completed plans and taken figures for the construction of a three-story and basement residence at 2970 Broadway, San Francisco, for Mrs. Sidney Ehrman. The interior will be finished in marble and hardwoods, while the exterior will be pressed brick and terra cotta. Provision for a ball-room is made in the basement. The house will probably case $60,000.

Insurance Company to Build

It is stated that one of the large insurance companies in San Francisco is about to erect a building of its own on the lot on the north side of California street, between Sansome and Montgomery, and opposite the Merchants' Exchange building. The lot is said to have sold for $100,000.

Claremont Hotel

The Claremont Hotel, originally designed by Architect C. W. Dickey of Oakland and never completed owing to lack of funds, is to be finished at once and opened to the public in May. John Carson of Oakland has prepared the plans and will superintend the work.

Addition to Bank Building

The Bank of Martinez directors have decided to construct a two-story building adjoining the bank at Martinez.

Monterey Masonic Temple

Architect John Davis Hatch, Humboldt Bank building, San Francisco, has let a contract to F. F. Moore of San Francisco to build a two-story frame and plaster Masonic Temple at Monterey. The cost is under $10,000.

News From the Front

Architect Albert R. Walker of Los Angeles has received a letter from Architect Fernand Parmentier of the same city containing the good news that in spite of the hardships of a winter campaign in the European war, he is faring well physically and is looking forward to his return to this country. The letter which was written January 25, and received February 12, follows:

January 25, 1915.

My Dear Walker:

I have received your letter of December 31st, 1914, advising me of my elevation to Fellowship in the Institute. It is a great comfort to receive news testifying the kindly remembrance of my fellows in California and the Institute while here amidst our grim surroundings.

I am not permitted to go into many details nor write lengthy letters, but our hardships have increased many times with the advent of the winter. I shall have much to tell when I return, and should I fail to do so, my last thoughts shall be with gratitude to my fellow professionals who have been so kind to me, and the Fellowship in the Institute I shall Prize above all other things to the last moment.

We become accustomed to look with indifference upon scenes, which in time of peace would fill us with horror, and every once in a while, another comrade fails to respond to roll call, with whom but a few moments before we exchanged friendly words.

I am still in good health and gaining in strength and power of resistance, for all of which I am truly gratefnl.

My kind remembrance to all my fellows of the Chapter.

Sincerely,

(Signed) Fernand Parmentier.

My present official form of address is

Fernand Parmentier, Caporal,
74 ieme Regiment d' Infanterie, 6 ieme Compagnie,
Section Postal No. 155,
France.

Oakland Skyscraper

It is authoritatively announced that work will shortly begin on the construction of a $600 000 fourteen-story office and theater building at the northeast corner of Fourteenth and Franklin streets, Oakland, from plans by Architect Carl Werner of San Francisco, formerly of O'Brien & Werner.

The building is to be erected by the Archon Co., of which J. F. Carlston, R. M. Fitzgerald, W. H. L. Hynes, Charles P. Hall and E. J. Downer are directors. It has been leased for a period of ten years by J. R. H. Jacoby and H. S. Merritt, formerly picture film manufacturers of Seattle. The theater will be conducted by the Turner & Dahnken syndicate and will be the most ambitious and most elaborately appointed moving picture house west of New York City.

Of Italian renaissance architectural design with two upper and two lower stories of cream colored terra cotta and the main body of the building of light buff pressed brick, the structure will prove one of the handsomest in the west. The lobby of the theater will be of especially elaborate finish of Botticino marble and Caen stone with a base of black and gold marble.

Engineers Elect Officers

The annual meeting of the Engineers' and Architects' Association of Southern California was held in January at the three-story reinforced concrete warehouse of John A. Roebling's Sons Co. After an inspection of the building under the guidance of Manager Ira J. Francis and his staff, the guests were adjourned to the Jonathan Club. The election of officers resulted as follows:

Samuel Storrow, president; A. H. Koebig, first vice-president; W. A. E. Noble, second vice-president; Arthur S. Bent, J. J. Backus, A. S. Martin and Kenneth Sibley, directors.

Carnegie Library

Architects Fabre & Bearwald, Merchants' National Bank building, San Francisco, have completed drawings for a one-story and basement library building to be erected at Willitts, at a cost of $8,000. Construction will be brick with slate roof, and hot air heating.

The same architects are preparing sketches for a store and flat building of frame construction to be erected close to the fair grounds at an estimated cost of $8,500.

Personal

J. C. Morrell, A. R. I. B. A., representing the government of Victoria, Australia, was a recent visitor to San Francisco and called at the office of this magazine to pay his compliments. Mr. Morrell is the Government Architect, Public Works Department, of Melbourne, Victoria, Australia. He has been spending considerable time for his government traveling in the interest of city and town planning.

Women's Club House

Architects Bliss & Faville of San Francisco have been commissioned to prepare plans for a splendid club building for the Women's Athletic Club. It will be erected on Sutter street and will combine gymnasium, plunge and general club rooms. By the time construction work is commenced it is hoped to have a membership of 1,000 women. Mrs. Lawrence Harris is secretary of the club.

San Mateo County Mansion

Architects Willis Polk & Co. of San Francisco have prepared sketches for a costly country house to be erected in San Mateo county for Mrs. George Cameron, daughter of the publisher, M. H. de Young. Mr. Cameron is the head of the Santa Cruz Portland Cement Company.

Wingfield May Build Mansion

It is reported that the Goldfield millionaire mining man and banker, George Wingfield, will erect a mansion in San Francisco.

Review of Recent Books

of Interest to the

Architectural and Engineering Professions

By CHARLES HENRY CHENEY

MODERN CIVIC ART. By Charles Mulford Robinson.

There is no contributor to the æsthetic side of city planning and civic adornment more entitled to respect and a careful perusal of his work, than Mr. Robinson, who may be called the dean of city planners in this country.

When this first appeared it was almost the only work of an American on the subject, and while in the past ten years we have made great strides in city planning, the present volume, now appearing in its third edition, contains a great deal not to be found elsewhere.

It gives distinct impetus to the widespread movement for community comfort, beauty and attractiveness. It is a strong appeal for better things.

Published by G. S. Putnam's Sons, New York. $3 net.

INDIAN BLANKETS AND THEIR MAKERS. By George Wharton James.

A splendid book on a subject of great interest to most Westerners. The fine color illustrations give one a distinctly better and more respectful idea of the art of the aborigines. It is indeed remarkable how far these people have gone, and Mr. James not only shows the motives of design and how they have been most naively carried out, but he has consistently reproduced blankets of a higher artistic merit than is generally appreciated to exist, as well as photographs of the methods of weaving. This is a work of merit, interesting and worthy of any man's library.

Published by A. C. McClurg & Co., Chicago, 1914. 120 illustrations and 213 pages. Price, $4 net.

MODERN GOTHIC ARCHITECTURE. By T. Francis Bumpus.

Although this volume contains some reproductions of modern architecture in England, it is more truly a glossary or hand book of Gothic architecture, traced from the Byzantine and Italian-Romanesque, through the Anglo-Norman and various periods of English Gothic.

While written entirely from the English point of view, it contains numerous photographs of the best English churches of all periods.

Published by Dodd, Mead & Co., 1914. 143 illustrations, 359 pages. $3 net.

PROCEEDINGS OF THE IMPERIAL HEALTH CONFERENCE, London, 1914.

That one-third of such a conference should be taken up in a discussion of housing and town planning is significant of the trend of the times in England, where community spirit and community action have taken up actively these most important problems. The papers by Raymond Unwin and others are full or practical suggestions and carefully thought out proposals for handling the difficult questions of land values, more open spaces between houses and the effect of bad housing upon public health. No doubt the great advancement in England, through the Garden City Movement, for better housing, is due to the wide interest and unselfish work of all professions and parties. Such reports are full of suggestion for getting city planning started in this country.

Published by the Victoria League, No. 2 Milbank House, Westminster, London, S. W.

HOW TO FRAME A HOUSE.—By Owen B. Maginnis.

This is the seventh edition of the author's now standard treatise on house and roof framing. It is an able discussion of the best methods to employ in American "balloon" framing. The work is enlarged over previous editions with many added chapters of interest to the builder. A chapter on "Rustic Carpentry and Joinery" is interesting and valuable, especially to Coast builders interested in slab and half-log construction.

Published by the William T. Comstock Co., New York.

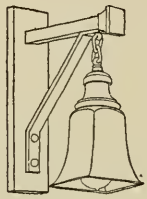
Other Books Received

CONCRETE STONE MANUFACTURE. By Harvey Whipple. Published by Concrete-Cement Age, Detroit. Postpaid, $1.

THE IMPROVEMENT OF TOWNS AND CITIES. By Charles Mulford Robinson. Putnam. New York. $1.25 net.

Shea & Lofquist to Be Supervising Architects

Architects Shea & Lofquist of San Francisco have been commissioned to supervise the construction of the new Hall of Justice at Sacramento. They will act as a consulting board, and their duties will be similar to those of Messrs. Howard, Meyer and Reed of San Francisco.



Heating and Lighting

Plumbing and Electrical Work

Edited By CHARLES W. FORTUNE

Development in Heating and Ventilating Industrial Buildings*

By E. L. HOGAN.

THE industrial building of today is heated by one of three methods: direct steam; direct hot water; or by forced circulation of air which is heated by heaters, supplied by steam or hot water, and centrally located. The greater number are heated by direct steam because it can be installed by any steam fitter and frequently the superintendent with his millwright and other help can do the work. They know more about his system than any other and are not keen for methods they do not fully understand.

In certain lines of industry where moisture from some drying process or otherwise, must be absorbed by the air within, the blower or hot blast system is most efficient because by means of it the moisture is removed by the circulation of the air that heats the building. Also in buildings where smoke or gases must be removed, the forced circulation is desirable.

In order to study the movement of air currents let us assume a building as illustrated in Fig. 1. This could be used as a foundry, machine shop, car shop, structural steel plant or forge. The side walls are of concrete blocks and glass set in steel sash; the frame work is of steel, the floor of concrete; the roof of reinforced concrete with composition roofing cover.

The natural air currents in the structure would be as indicated by small arrows in the illustration. This movement is caused by the difference in temperature of the air within; that coming in contact with the cold roof, monitors and outside wall becomes cooler and heavier, and consequently falls. The warmer air in contact with the floor rises and circulation is set up tending to equalize the inside and outside temperature.

From a heating standpoint we are interested in a strata covering the lower eight feet of the interior. This must be kept comfortable and fairly uniform. It can be accomplished by creating currents in the upper portion of the building so that no cold air will reach the floor, taking care of the outside walls by radiant heat from radiators placed above and out from the walls, or below and on or near the walls, and taking care of the lower strata of air by heat from the hot strata above. This method is practically keeping the exposed surface of the structure warm so that there will be no cold currents in the working portion.

In structures of this kind where the peak of the roof is 40 feet or 50 feet above the floor and a working temperature of 65 degrees near the floor is maintained, the temperature near the peak will be approximately 90 degrees. While it is apparent that by keeping the exposed surface warm or keeping a layer of warm air next to it, that the inside of the structure will be warm, nevertheless, it would seem as though it would be better to keep the working strata warm and do so in such a way as to prevent the cold currents from entering this strata. This would reduce the temperature of the air in proximity to the cold exposed surface and decrease the heat loss from the building.

In order to produce results like this it would be necessary to continually mix hot air with the air in the working strata in order to maintain a working temperature. In this system the hotter portion of the building is the lower, and the radiant heat is up and toward the exposed surfaces. Air mixes or diffuses very rapidly and sufficient air must be circulated in the lower working strata to maintain a uniform temperature. Such a system is what is aimed at with hot blast and what is frequently obtained. It is surprising how well and with what a little heating surface and consequent small steam consumption you can heat a building in this way.

A distributing system which would approximate these results is indicated on this plate in Fig. 2.

Frequently it is attempted to heat a structure like this with a hot blast system by simply having outlets in the mains and no drop pipes. In this case it would be necessary to direct air toward the outside

* Paper presented at the recent Annual Meeting of the American Society of Heating and Ventilating Engineers.

walls and downward at various angles in order to produce a distribution and the heating would revert to a condition where you would have to warm or produce a layer of warm air next to the radiation system. The exposure in this case would be larger and the usual method of figuring would not suffice.

In figuring the heat losses from a building you should first determine how you are going to heat it and then it will be possible to determine what the difference in temperature may be between the inside and outside of the various parts, such as outside

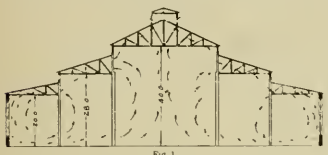


Fig. 1

wall, glass, roof, monitors, etc. As it is now, we take the temperature desired and assume that this is the inside temperature all over and with all methods of heating. The heat losses from the building shown in Figs. 1, 2 and 3 would probably be determined as follows: Inside temperature, assume 65 degrees; outside temperature, corresponding 0 degrees. Exposures would be as follows: exposed wall surface; exposed wall glass surface; exposed roof; exposed monitor wall; exposed monitor glass; exposed floor.*

Using constants for radiation losses our table of losses would be as follows:

Kind of Surface	No. of sq. ft.	Diff. in Temp.	Constant	Con. x Temp. diff.	Heat loss in B.t.u.
Outside wall.....	9,040	65	.33	21.45	194,000
Outside glass....	10,760	65	1.2	78.	838,000
Outside roof	38,400	65	.3	19.50	711,000
Monitor wall	3,600	65	.4	26.	93,600
Monitor glass ...	4,800	65	1.35	87.8	422,000
Monitor floor ...	36,000	35	.31	10.85	391,000
					2,649,600
Total heat loss equals.....					2,649,600 B.t.u.
Heated day time, only add 10%....					264,900 B.t.u.
For infiltration of air on windy days add 10%.....					264,900 B.t.u.
					3,179,400 B.t.u.

Total cubical contents of structure—1,180,000 cu. feet.

With a condensation of ¼ per square foot of direct radiation, this structure would require 13,200 square feet or 1 square foot for every 89.3 cubic feet.

With direct radiation placed along the outside walls or suspended from the roof trusses the average temperature between the inside and outside of the exposed surface would be greater, the heat loss approximately 3,663,000, and the radiation required would probably be approximately 15,250 or 1 square foot to 77.4 cubic feet, providing for the same extra 10 per cent to heat up quickly in the morning where the building is used during the day time only and also for loss due to infiltration of air on windy days.

Now if a hot air system were used with drop pipes so as to distribute the air over the working strata, the average loss from the building would in all probability be approximately 2,680,000 allowing for the same extra amounts under similar conditions. However, to partially offset this, is the loss in temperature of the air due to radiation from the distributing ducts. This amounts to approximately 8 per cent, varying with the shape of building or the extent of the distributing ducts. This would be equivalent to increasing the radiation loss by 8 per cent, which would bring it up to 2,900,000 B.t.u. Thus it would seem that by applying the heat to the area where it is required, we would have saved approximately 21 per cent of steam required. This would only be possible with a blower system and with distribution to the strata required as indicated in Fig. 2.

If the drop pipes or ducts were stopped within 3 feet of the main duct and the air directed out toward the outside walls and down, the problem would become similar to the direct radiation installation and the losses would be between 3,179,400 and 3,663,000 which would be more nearly correct, and in this event the saving due to the use of a properly designed hot blast system would be approximately between 9 per cent and 21 per cent.

Owing to the fact that a hot blast system can be overloaded and is also capable of forcing the heat to all parts of a structure under adverse conditions, the average purchaser expects a great deal more from it than from direct radiation and our experience has been that a hot blast system has to do about 20 per cent better work than would be expected from a direct job. A great deal more is expected of something which is more conspicuous and which has a moving or operating part.

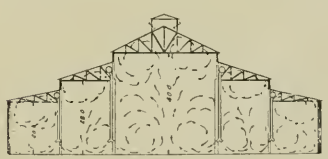


Fig. 2

There is one thing which should be kept in mind and that is that as the outside temperature rises and the requirements become less, the temperature of the air or the quantity of the same, may be reduced, and in practice this is done so that the average amount of steam used for a season is much lower than the maximum requirements.

*This article was written for Eastern temperatures.

With a direct radiation installation the temperature of the steam cannot be lowered because generally exhaust or low pressure steam is used and hence the only way to cut down the quantity is to cut off certain parts of the radiating surface. This does not distribute the heat as well as before and therefore is not generally done. The method pursued is to open the windows and increase the radiation loss to a point where it will maintain a comfortable temperature and while the average outside temperature is higher than the maximum requirements the quantity of steam is not reduced materially.

Now as regards cost of installations. The design and manner of fan blast application is something that can always be worked out to good advantage though the method of application must necessarily depend upon the character of the building and its uses.

The ordinary industrial building presents the simplest of all problems. As a rule the per capita space for the workmen is large and the heating only is of paramount importance while ventilation is, in a way, incidental. As a rule ventilation can be secured by allowing the fan to draw its air from the building, thereby turning the air over and over, merely adding to the heat necessary to offset the leakage and radiation losses. To this end it is desirable that apparatus be placed as near to the centre of the building as possible so the circulation is nearly uniform from all sides.. Such a location very much simplifies the distributing arrangement and materially reduces the cost.

From the apparatus the air is discharged into underground or overhead pipes to get to its proper destination. It follows from the above, however, that the best results are obtained by discharging the heated air near the floor and outward so as to distribute it as nearly uniform as possible. It is usually most convenient to carry the piping overhead in the manner shown in Fig. 2.

The average class of industrial buildings can very often be heated satisfactorily with a limited number of ducts by discharging the air at high velocity and thus compelling it to continue its direction of movement for a considerable distance without the use of conducting pipes. This simple construction must be adapted to the character of the work carried on in the building, extra refinement in the manner of distribution being unnecessary where the workmen are actively employed. However, great care should be used in such a distribution not to have the air currents strike the occupants, as many systems have been condemned for this reason—no fault of the heating, but of the distribution.

In other cases, when obstructions interfere, the air can be forced only a short distance and local distribution is necessary. This is common in the ordinary car paint shop. There the air is generally discharged downward toward the floor through pipes extending down between the cars. This not only heats the building but the time of drying is very materially decreased.

A similar problem is the case of a locomotive roundhouse where a blower system can be made to serve a double purpose. The general heating can be accomplished by discharging the air from overhead pipes toward the walls on either side or it may be utilized as a means of rapidly melting the snow and ice from the running gear of the engines by discharging all or a part of the warm air into the pits.

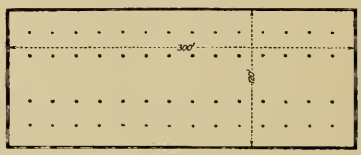


Fig. 3

Industrial building two stories and higher can very often be equipped and satisfactorily heated without any distributing pipe connections by having vertical flues built in the walls from which the air is discharged toward the opposite side through openings from 8 to 10 feet above the floor line. These flues add but little to the cost of the building if the same are taken care of in the architectural design.

Whenever the flues can be built in the walls and the distributing ducts are of moderate extent the system will figure less in first cost than any other capable of attaining the same results.

From the standpoint of equivalent results a blower system of heating can be installed at not greater expense and with as much profit to the contractor as a system of direct radiation. It can be overloaded or can be operated as conditions require. In this way the steam consumed is minimum. If motors are used it might cost more to operate the fan but the saving in steam would more than offset this. There is the added advantage that ventilation is possible and where moisture is to be removed there is no comparison, as circulating air is the universal absorbing medium. In many cases, for no greater expense during the year, ventilation and heating can be produced for what heating formerly cost.

One feature of hot blast heating that is particularly apparent to us is that most contractors do not have the confidence in their ability to make the installation a success that they do with direct radiation. As a result, very often direct radiation is resorted to where a fan system would be more satisfactory and economical. We think this is due possibly, to the feeling in general that a fan system is more or less guess-work. Nothing is further from the truth, for the science of hot blast heating has been developed until absolute results can be guaranteed by the leading concerns.

The Heating and Ventilating System of the Oakland Technical High School*

By W. E. LELAND, S. B.

THE heating and ventilating apparatus of the Manual Training and Commercial High schools in Oakland consists of a system of direct steam radiation for the entire building, supplemented by a mechanical ventilating system for all of the class rooms and rooms occupied by large numbers of pupils.

The heating apparatus is a complete vacuum low pressure system with the steam and return mains run near the basement ceiling and with vacuum valves on all the radiators and at all drip points in the basement mains.

The distributing system extends over a very large area, the radiator on the end of the longest run being approximately 900 feet from the boiler plant.

The ventilating system is divided into three separate units, one in each of the two sections of the building on each side of the assembly hall and the other, a separate system for the assembly hall alone.

The two large ventilating units each consists of a double width steel plate ventilating fan with a fan wheel of the multi-blade pattern and of a capacity to handle about 45,000 cubic feet of air per minute. The fresh air is brought to the fans through large fresh air shafts from the roof and is drawn through heating stacks of cast iron indirect radiation, where it is warmed to a temperature of approximately 70 degrees and then distributed to the rooms through a system of galvanized iron ducts and flues.

The object of the separate systems for heating and for ventilating was for economy of operation. With the double system it is not necessary to use the fans while heating up the rooms before class time, and it also saves loss of heat in the long runs of distributing air ducts and also obviates the rather cumbersome method of heat regulation necessary with the single warm air system.

The temperature of the individual rooms is automatically controlled by a thermostat connected to operate the valves on the direct radiators in the room and the temperature of the fresh air supply is kept at a constant point by a thermostat in the main fresh air duct near the fan and controlling the valves in the steam connections to the indirect heating stacks.

The apparatus for the assembly hall is a combined system, the room being heated by warmed air, which is also used for the ventilation. The fan is of the same style as the large ventilating fans, only of the single width pattern and of a capacity to handle 20,000 cubic feet per minute, which is warmed to the proper temperature for the heating of the room by cast iron indirect heating stacks thermostatically controlled to maintain the desired temperature in the auditorium. There is no direct radiation in this room.

The shops, which are separate buildings connected with one wing of the main building by a corridor, are provided with hand-controlled direct steam radiation only, and no attempt was made for artificial ventilation.

All toilets, locker rooms and chemical laboratory hoods are provided with exhaust ventilation, which is handled by two direct connected exhaust fans in the attic of the building, each of which is capable of handling 15,000 cubic feet of air per minute. All toilet exhausts are connected to the utility chambers behind the fixtures and the air drawn through the fixtures.

The two large ventilating fans are driven by belted motors wound for alternating current, and the auditorium fan and toilet exhaust fans are operated by direct connected direct current motors, the current for which is supplied from a motor generator set in the boiler room.

The building is cleaned by a three-sweeper low vacuum fan type vacuum cleaning machine.

The steam generating plant consists of two water tube boilers of 130-horsepower each, operated with oil burners of the mechanical atomizing type. The boilers are operated at a pressure of about 80 pounds and the steam reduced to about five pounds for the heating system. The high pressure steam is used for the operation of the vacuum pump and the boiler feed pumps.

The vacuum pump is connected directly to the return mains and the discharge from this pump is delivered to a receiving tank vented to the atmosphere, where the air and water are separated. The feed pumps draw their supply from this tank and are automatically operated by the level of the water in the return tank. The return tank is provided with a hand controlled cold water connection for makeup water.

After the apparatus had been installed an evaporative test was made of one boiler and one oil burner, during which

*The J. C. Hurley Co., in addition to installing the heating and ventilating apparatus in the Oakland Technical High School, has had the contracts for similar work in the following large school buildings:

Cleveland, Jefferson, Longfellow and Emerson school buildings of Oakland; the Science building of the Stockton High School, the Lansdale School in San Anselmo, and the Odd Fellows' building, Oakland. The company has at present under contract two schools in Santa Cruz, the Branciforte and the high school, as well as the Grant School in Richmond, and expects shortly to sign up on a number of other important heating and ventilating contracts.

the boiler was shown to be capable of developing 182.5 horsepower at a rate of 14.94 pounds of water per pound of oil, which was approximately 51 per cent above the capacity and 7 per cent above the equivalent evaporation called for in the specification.

A Gas Generator of Exceptional Merit

One of the interesting working exhibits at the Panama-Pacific International Exposition is that of the Utility Gas Appliance & Sales Company of San Francisco. This company is making a special feature of a comparatively new pattern machine known as the "Oliver" Gas Generator, which has been installed in many homes on the Pacific Coast, and is undoubtedly proving the very latest and best gas-making machine for both large and small installations yet introduced.

The question of light in many isolated localities often presents difficulties, beyond which there is always the consideration of an economical and satisfactory fuel for the purposes of cooking and heating. The "Oliver" machine solves the problem, as it furnishes a gas equally efficient for all three purposes above referred to.

In the Machinery Hall the company's exhibit consists of several types and sizes of this particular generator. One is driven by a small engine which works itself automatically, and uses as fuel part of the gas which it makes. Another type shown is operated by electricity, and yet another receives its power by means of a small Pelton water wheel.

The first of these models is furnished for isolated homes or other places where neither water pressure nor electricity is obtainable. The second shows the style of plant which is installed in homes where electricity is available, but where the gas is used more especially for cooking and heating. A very great number of farm houses and other buildings have electricity as a means of lighting, but here the Utility Company's generator is used to furnish gas for the purposes of cooking and heating, and lastly, where water pressure is obtainable the third type referred to is advisedly installed, the water power taking the place of either an engine or electricity. Other forms for obtaining the air pressure, such as falling weights, can be supplied, but the three methods above referred to have proved the most satisfactory.

Utility gas is absolutely free from danger. It is practically odorless, and becomes non-explosive should it be allowed to escape without being lighted. It is harmless to breathe, and what so truly proves its purity is the fact that its combustion has no effect on plant life, and thus an open stove burning utility gas can be used as a means of heating hothouses containing the most delicate plants.

The exhibit in the Machinery Hall demonstrates this extremely simple method of making gas, as well as its application for lighting, heating and cooking. The remarkably simple construction of the machine and its complete automatic features will appeal most strongly to all those whose light or heat problem remains unsolved.

In connection with the exhibit in the Palace of Machinery the Utility Company have erected a model home, close to the main east entrance of the Machinery Hall, in which a 500-light plant is in constant use, producing gas for all purposes. Cooking will be continually demonstrated and all whose interest centers in such an interesting proposition should make a point of inspecting the many advantages which an installation of the Utility gas-making plant can furnish.

Society for Electrical Development

At a recent meeting of the board of directors of the Society for Electrical Development held at the society's offices in New York, the matter of employing a resident representative on the Pacific Coast was discussed and referred to the president and general manager with power to act.

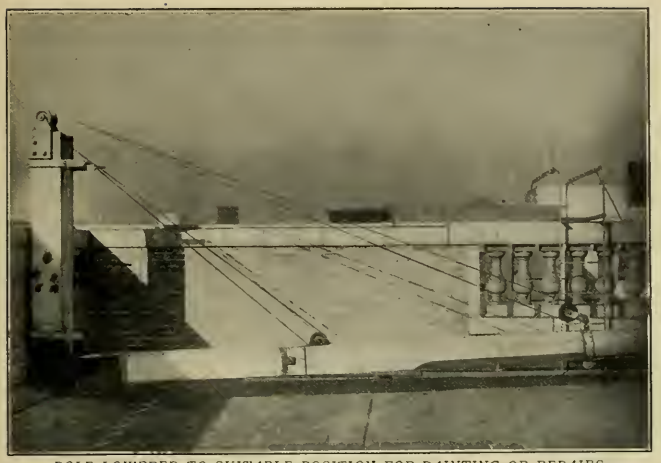
James Smieton, Jr., who has been acting as secretary-treasurer for the past year, was appointed secretary-treasurer of the society.

The principal matter under discussion was the plan for a national electrical week. The board unanimously approved the plans of the committee, and it was decided to go ahead with the plans for an electrical week, the date for which was not definitely decided upon. The majority of those present, however, were in favor of holding it early in the spring of 1916, as it was felt that this would give the manufacturers of all kinds of electrical devices a better opportunity to reap a substantial benefit, and it was recognized that a year's hard, earnest work will be required to perfect and carry out the plans necessary for so important an event of so far reaching an effect. The matter was referred to a committee to be appointed by the president.

Two Distinguished Architects Visit Fair

Thomas Hastings, architect and artist of New York, who designed the Tower of Jewels at the Exposition, visited San Francisco the latter part of February and viewed for the first time the completed creation of his brain. Hastings, after studying in Paris, engaged in his profession in New York, the firm being Carrere & Hastings. He is the designer of the Ponce de Leon and Alcazar hotels at St. Augustine, Fla., the New York Public Library, the Academy of Design and other notable structures.

W. R. Mead, the New York architect, once a member of the firm of McKim, Mead & White, registered at the Fairmont. Mead is one of the most famous architects in the country, his work and that of the firm of which he was a member being monumental. He came to California for recreation and for a study of the buildings at the Panama-Pacific International Exposition.



POLE LOWERED TO SUITABLE POSITION FOR PAINTING OR REPAIRS

A Safety First Device—the Pendergast Flag Pole Tackle

HERE is something the architect has long been looking for; something the contractor has many times been asked to deliver, but could not; a device that the owner has repeatedly inquired about with little or no encouragement.

It is only recently that this something has been perfected and placed upon the market—thanks to the enterprise of the Pacific Foundry Company. The Pendergast flag pole tackle, for that is the name of this much sought after article, has been devised for the purpose of simplifying the maintenance of flag poles on buildings, and overcoming the present necessity of securing services of a special workman for necessary painting and repairs.

It is an admitted fact that the present system of sending a workman up a pole to make repairs is dangerous both to the public and the man, and repairs cannot be made as effectively as if the pole were lowered to the roof.

The Pendergast flag pole tackle is a "Safety-First" device whereby the pole can be readily lowered by your building employees—the pole can be thoroughly inspected by building superintendent—necessary repairs can be made—it can be scraped and suitably painted—and raised to original position—without calling in outside workmen, without danger, and at minimum cost.

The device can be applied to most buildings having a flat roof and provided with a stub pole, and it is in successful operation on several of the large San Francisco office buildings, including the ten-story Standard Oil building.

The device consists of a system of steel cables, sheaves and drums applied to the pole and operated by hand worm and gear, which allows of complete control of the lowering or raising operation.

It is generally assumed that the pole will be fastened by bolts or stirrups to the stub pole built into the fire-wall or other location, and a steel plate base with hinge pin is bolted to stub and pole.

A shackle is fastened around pole at suitable distance from base and provided with suitable rope sheave. A second plate with sheaves is bolted to pole at top of stub. The rope is then reaved through these sheaves and fastened to controlling drum. This drum is keyed to operating shaft and one man can easily raise or lower the pole by use of removable handle provided. When the pole is raised to position against the stub, stirrups are bolted on to take the strain from the cables; and to lower again it is only necessary to uncouple the stirrups and see that the cable is in proper position.

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State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

City and County Highway Drainage*

By FRANK REED, Los Angeles, California.

Corrugated iron and concrete are the two most popular materials for constructing drainage channels under roads and railroads and like purposes in California, and this article is prepared after a careful study of the conditions of such work in Southern California, where flood emergencies call for special treatment. It also gives the results of experience under ordinary city and county highway conditions.

DRAINAGE is as much a question of economics as of engineering. Economics makes engineering interesting by placing a dollar doubt beside every assumed balance of forces. When such doubts are reduced, those charged with the wise distribution of the expenditures of a civic body enjoy peace of mind. Past experience is the best guide to the future, but not a perfect one. Destruction sometimes visits the works of the best of engineers. This may be because they have not foreseen the precise amount and intensity and mode and point of application of the destructive forces. More often they will have realized the possibility of their occurring but decide that the probability was so slight that it would cost too much money to provide a structure able to resist the attack.

Decisions on type and structure in doubtful cases usually represent not alone the judgment of the engineer, but a composite of his judgment with that of the executive officials of the civic body who make the allottment of the budget. It is an important question, both of detail and of general policy, how far it is good judgment to go toward providing a structure which is strong enough to meet any possible stresses suggested by the experience of exceptional disasters, which occur only once in many years.

Annual charges on invested capital are a certainty. On the other hand floods, for example, are variable from year to year. There can only be one greatest flood, and its like may not come again during the lifetime of the engineer, or the normal existence of the structure he has built.

The problem then is to insure a reasonably permanent structure at a reasonable cost. Of course, an ideal structure is one which not only provides a good margin of safety at a low proportionate expenditure, but which will behave well and permit of economical replacement, when subjected to the stresses, such as the floods that occurred last year in Ohio, and Indiana, and California, which good financial policy would not warrant the engineer in providing against with a structure of certain permanence.

Corrugated iron culverts behaved well in last year's flood emergencies. They stayed in place where everything else washed out. Elsewhere they gave a good answer to the question, "Suppose it does go, how much is lost in delay to traffic and replacement expense?" The big corrugated iron tubes rode down stream undamaged in floods, were dragged back with mules or horses and

* This article appeared in the November (1914) issue of Municipal Engineering.

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buried in earth and were carrying traffic in record time and with record economy. No special materials, no special outfit, and no special labor were required for their replacement. Just ordinary earth work, and ordinary labor to handle the teaming of the culverts, and of the earth work, and its shoveling and tamping. And the hasty temporary replacement became a part of the new and permanent structure. It did not have to be ripped out and wasted incidentally to the permanent repair.

So corrugated iron culverts and drains have claimed special attention since these disasters, and investigation has brought out a greater appreciation of the ordinary, everyday good points, which have won for this type of structure a steady increasing use and support among engineers responsible for the best type of city, rural and mountain highway construction, as well as by their professional colleagues in the steam and electric railway fields and elsewhere.

A series of questions were distributed by the writer among representative municipal engineers of California, where culverts get hard service tests, with the view of ascertaining their experience with, and judgment on the use of corrugated iron culverts. The replies, without exception, indicated their use during a sufficient time to enable users to come to a settled judgment, and increasing use of this type of culvert, and a state of satisfaction with it.

In drain and culvert practice, the round corrugated iron culvert has been installed in a great variety of conditions and sizes, from 8-inch to 84-inch, and gauges of iron No. 16 to No. 10. Part circle culverts are meeting with an increasing use where side drains and intersections must be built in such a manner as to secure the necessary strength with the least possible depth of structure. They enable the engineer to take care of the flow of water by providing a broad rather than a deep conduit.

A School for Water Works Employees at San Diego

THE Department of Water at San Diego lays all its pipe, valves and fittings by force account, and also builds its own pump stations, flumes, aqueducts and other works. The valuation of the entire system for the collection, conveyance and distribution of the works is $7,500,000. The distributing system consists of over 400 miles of pipe; the temporary pipe is wrought iron of a minimum size of 2 inches and the permanent pipe is cast iron ranging from 4 inches to 36 inches in diameter. The impounding system consists of four large reservoirs. The department at the present time is constructing a concrete dam, 70 feet high, by day labor.

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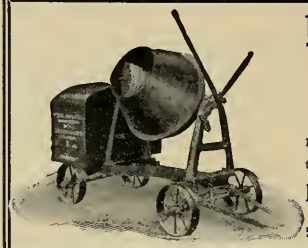
To carry on all the foregoing activities several hundred men are employed. As it is the superintendent's aim to have the highest attainable efficiency in the conduct of the affairs of the department of water, he has had periodical meetings with the men for the purpose not only of getting them together and thereby making them better acquainted, but to familiarize each of the various bureaus, into which the department is divided, with the work done and the methods employed by the other bureaus. Thus a study is made of the procedure within the department from the time a request for material is issued until the material is delivered on the ground and ultimately placed in the improvement for which it was ordered. At these meetings the various construction foremen and other employes of corresponding rank in other bureaus read papers in which they record their experiences and the methods they employ in handling the work in their charge.

The results obtained by the meetings have considerably raised the efficiency of the department. The men take a keen interest in the meetings. Good fellowship is also promoted, as it brings the men and foremen together, thereby oftentimes eliminating imaginary grudges. The superintendent, who is also a member of the city council at San Diego, has many demands upon his time, and only by means of the meetings here dis-



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cussed can he get in direct personal touch with the various employes.

The character of the programmes of papers presented before these meetings may well be illustrated by the meeting held on January 27, 1915, in the council chambers of the city hall at 7:30 p. m. The names and titles of the officials on the program, at that meeting, and the titles of their papers, were as follows:

Rainfall, Runoff and Catchment, by Rudolph Wueste, Supervisor, Bureau of Conservation.
Durability Test Given Meters, by W. O. Allen, Inspector, Bureau of Engineering.
Accomplishing Results, by G. E. Gabrielson, General Foreman, Pine Creek.
Development Plan for Distributing System, by P. H. Thearle, Chief Draftsman.
Making and Inspection of Hydrants and Fittings, by Nate Van Denburgh, Receiving Clerk.

The success of this plan at San Diego naturally leads to the suggestion that it be tried elsewhere. No doubt such meetings could be held to great advantage in the water departments of all cities of a population exceeding 100,000. In many smaller cities the plan might well be tried.

Material Men and Contractors Favored

In a ruling given State Controller John S. Chambers, concerning claims filed with him against money owed by the State to Robert Trost & Co., of San Francisco, Attorney General Webb has rendered a decision distinctly welcome to contractors and material men throughout the State.

The decision holds that the claims of contractors and supply firms, filed with the Controller in accordance with the lien law, take precedence over a judgment previously given in favor of a creditor of the firm, not interested in the particular contract in question.

The Trost company has the contract for erecting a State building in Los Angeles, under the State Department of Engineering. According to the Sacramento Bee the company has become financially embarrassed, and State Controller Chambers has had notices served on him from sub-contractors and supply houses, demanding the retention by the Controller of such money as is due Trost from the State. A creditor, whose claim dates to an earlier contract held by the company, has a judgment for the collection of a large sum.

Attorney General Webb holds that, as the money in the State Treasury owed, or to be owed, to Robert Trost & Co. was appropriated by the State for the purpose of constructing this particular building, it is not subject to liens of any sort based on claims other than those that grow out of this contract.

Money now held by the State but owed to Trost & Co. must be applied to the satisfaction of the demands of the sub-contractors and material men who have filed their claims, and as there is not a sufficient amount to pay all these claims, the claimants must participate pro rata in the distribution of the money.

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Bonding Asphalt to Concrete

Among the several problems to be met in the recent construction of the concrete reservoirs in San Francisco was that of bonding asphalt to concrete. According to B. N. Abbott, in a letter to The Engineering Record, after making unsuccessful attempts to apply the asphalt direct to the concrete in various ways, the expedient of first painting the surface with coal-tar was tried, and it was found that when applied in this way under right conditions, the asphalt would adhere so firmly that after it had cooled it could not be broken away without bringing pieces of concrete with it.

Mr. Abbott states that in order to secure this result, the concrete surface was first scrubbed clean with a bristle brush, and over this a thin coating of hot coal-tar was "painted." The coal tar should be heated in small quantities, brought just to the boiling point, and then applied immediately. Heating the coal-tar in large quantities, which necessitated some delay before it could all be used, did not give such good results; and the gangs were therefore not allowed to heat more at a time than they could apply quickly as soon as it began to boil. The asphalt was spread over the tarred surface in the usual manner.

WANTED.—One or more copies of the March, 1914, number of the Architect and Engineer, this Office.

Southern Pacific Building Large Bridge

The Southern Pacific Railroad Company has under construction a million dollar steel bridge across upper Coos Bay, Oregon. C. R. Broughton, bridge engineer of the railroad, is in charge. The bridge from abutment to abutment will be 11,616 feet long, consisting of thirteen Howe truss spans, each 380 feet long, and one large draw span across the 650-foot channel. There will also be over a mile of steel viaduct as approaches at each end, resting upon heavy reinforced concrete foundations. Over 40,000 cubic yards of sand and gravel for the substructure have been stored in the railroad company's yards at Marshfield and North Bend, and it is expected that this will be sufficient material to carry the work through until the bunkers can be opened in the spring. The first deliveries of steel and cement are now being made at the docks in North Bend. The American Bridge Company designed the large structure, and are furnishing all the steel required.

Will Handle Simplex Oil Burner

The American Standard Oil Burner Company, Seventh and Cedar streets, Oakland, has taken over the entire assets and good will of the American Heater & Power Co. and will market through its various agents the Simplex Oil Burner. The new company has a very creditable exhibit in the Palace of Machinery, Panama-Pacific Exposition.

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San Francisco Contractors, What About This?

They like to boast as well as boost in Los Angeles. The following from the Southwest Contractor is a recent example to which San Francisco contractors may take exception:

Out of a list of twenty-four bidders on the general contract for the erection of the new group of buildings for the state normal school at Fresno, Southern California furnished eight of the bidders of whom the two lowest were Los Angeles contracting firms and the third lowest bidder was from San Diego. A San Francisco contractor was in fourth place and while another Los Angeles bidder submitted the highest proposal, the northern men uniformly overbid the southern men. Moreover, the successful bidders on the two other contracts, those for furnishing and installing the heating and plumbing equipment and the boiler plant, were Los Angeles firms.

Thus Los Angeles has gone into neutral territory which San Francisco has always claimed as her own, and has taken away a plum which the northern city evidently thought it could secure without real competition from the south. This is the entering wedge for control of the central portion of the state which Los Angeles by all right should develop as a field of competition on an equal footing with her northern competitor. San Francisco has always considered Bakersfield as her own and the Tehachapi as her southernmost business boundary. A readjustment of freight rates within the last three or four years has given Los Angeles an equal advantage much further north, with Fresno almost as the dividing line. Some lines of business have developed this general valley territory to the great benefit of Los Angeles commercially, but in the contracting field and building material supply line we have been slower to enter this territory. The need for extending our zone of activity is now greater, however, owing to general business luggishness, and the future ought to see the construction field in San Luis Obispo, Kern, Tulare and Kings counties dominated by Los Angeles, which has an equal if not better right to this business.

Concrete Pier Weathers Heavy Storm

(From the Venice, Cal., Vanguard.)

Barring the damage that may be inflicted by floating piles from other piers, the Santa Monica city officials have decided after inspection of the property that the municipal pier, a reinforced concrete structure, will withstand any storm that the ocean may send against it. The inspection shows that no impression was made on the pier by the huge waves that lunged against it in the recent February storm. The substantial character of the structure will be used as an argument in support of the legislation forbidding the erection of any more wooden piers along the California coast, which the Santa Monica officials will seek to have enacted. The reinforced concrete pier will outlast any other type of pier, officials affirm, but in the event that it should fall, the wreckage will sink and consequently will be no menace to other wharves and piers.

Wants to Superintend Infirmary Work

Arthur Arlett, the San Francisco and Oakland contractor wants the Alameda county supervisors to make him superintendent of construction of the proposed group of hospital buildings to be erected from plans by Architect C. P. Weeks. Arlett's fee would be about $15,000.

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Illustrated in this Issue

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When writing to Advertisers please mention this Magazine.

72 Buildings Erected in California from April to Dec. 1914 of Denison Interlocking Tile Blocks

Fruit Exchange Building, Sacramento—Mr. Chas. Kaiser, Architect.
Almond Shelling Plant, Sacramento—Mr. D. R. Bailey, Architect.
Forum Building, Sacramento—Mr. R. A. Herold, Architect.
Residence, Dr. Smith, Sacramento—Messrs. Wright & Kimbrough, Architects.
Two North Sacramento Schools—Mr. C. C. Cuff, Architect.
High School, Corcoran—Mr. J. Chas. Thayer, Architect.
High School, Ceres—Mr. William H. Weeks, Architect.
Grammar School, Fowler—Mr. C. K. Kirby, Jr., Architect.
Residence, Charles Schaeppi, Placerville—Mr. George C. Sellon, Architect.
Hotel Building, South San Francisco—Messrs. Thos. Day Sons, Contractors.
Moving Picture Theater, Berkeley—Mr. Wm. H. Ratcliff, Jr., Architect.
Dairy Delivery Co., San Francisco—Messrs. Jas. L. Brown, Inc., Contractors.
Pent House, Cliff Hotel, San Francisco—Mr. P. J. Walker, General Contractor; Mr. A. P. Brady, Masonry Contractor.
Fire House, Sacramento—Mr. Harry Finnigan, Contractor.
Garage, Marshall Diggs, Sacramento—Mr. C. C. Cuff, Architect.
Bank Building, Davis—Mr. George C. Sellon, Architect.
Warehouse, Lodi—F. F. Irey.
Residence, E. C. Zuckerman, Stockton—Mr. E. B. Brown, Architect.
Residence, W. H. Bennett, Stockton—Mr. Walter King, Architect.
Almond Warehouse, Lodi—Messrs. W. D. Voorhies & Son, Contractors.
Almond Warehouse, Fair Oaks—T. W. Ward, Contractor.
Store Building, Woodland—R. B. Cranston.
Store Building, Live Oak—G. C. Estes, Contractor.
Store Building, Chico—Mr. Peter Oberweiss, Contractor.
Modern Milk House—Dr. C. M. Faris, Yolo County.
Residence, Robert Donald, Suisun—Mr. C. C. Blair, Architect.
Packing House, Swanston Packing Company—(Partially constructed of Denison Blocks)—Mr. Jas. Seidler, Architect.
Grammar School, Escalon—Mr. C. P. Waltz, Contractor.
Store Building, 12th and J Sts, Sacramento—McGillivray Construction Co., Contractors.
Cheese House, Vio—Mr. A. A. Merkeley, Owner.
Grammar School, Folsom—Messrs. George C. Sellon and Alden W. Campbell, Architects.
Pent House. Commercial Bank Bldg., Stockton—P. J. Walker, General Contractor; A. P. Brady, Masonry Contractor.
School Building, Beverly Hills—Mr. W. J. Dodd, Architect.
School Building, El Segundo—Mr. E. L. Hopkins, Architect.

We're Proud of Our First 9 Month's showing

Loma Portal School, San Diego—Mr. T. C. Kistner, Architect.
Magnolia Grammar School, Riverside—Mr. Stanley Wilson, Architect.
Four Grammar Schools, Alhambra—Messrs. Allison & Allison, Architects.
Three High Schools, Alhambra—Mr. Norman F. Marsh, Architect.
Five Polytechnic High Schools, San Bernardino—Mr. Norman F. Marsh, Architect.
Del Rosa School, Del Rosa, Cal.—Mr. Anthony Beimer, Architect.
High School, Van Nuys—Messrs. Allison & Allison, Architects.
Grammar School, Corona—Messrs. Allison & Allison, Architects.
Grammar School, Azusa—Messrs. Allison & Allison, Architects.
Black Residence—Mission Ridge, Santa Barbara, Cal.
Dry Kiln—E. J. Stanton Lumber Co., Los Angeles.
Store Building—H. Gray, South Pasadena.
Residence—L. C. Caufield, Los Angeles.
Residence—J. M. Danniger, Beverly Hills.
Store Building—E. C. Haskell, Los Angeles.
Two Lemon Sweats, Etiwanda—Citrus Fruit Association, Etiwanda.
Two Store Bldgs.—E. W. Shaffer, Alhambra.
Garage—E. P. Hogan, San Gabriel.
Carnegie Library—Eagle Rock.
Garage—Studebaker Co., San Diego.
Aviary—San Diego.
Garage—W. A. Snelson, San Diego.
Depot—Santa Fe Railroad, San Diego.
Fire Engine House—San Diego.
Residence—Mr. A. Crueger, Los Angeles.
Residence—La Jolla, Cal.

Denison Interlocking Tile Walls Are Stiffer by Actual Test Than Old Fashioned Brick Walls

Drier and more fireproof than concrete, and more economical than either. The up-to-date architects and owners the country over are using them for building all kinds of structures from the simplest dwellings to gigantic hotels and office buildings.

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Denison Blocks are manufactured in North Sacramento

Office, 310 Ochsner Building, **SACRAMENTO, CAL.**

A Fireproof House of Interlocking Tile

NO building material concern in California that we know of has enjoyed more signal success in so short a period as the Denison Block Co., whose interlocking tile blocks are manufactured in northern Sacramento. In nine months seventy-two buildings have been erected in California of Denison interlocking tile blocks, the contracts ranging from a modest store building of a few hundred dollars valuation to a pretentious office building whose cost ran very close to the quarter-million mark. The company may well feel proud of this splendid showing, which indicates first an aggressive, always-on-the-job organization, and second, a product with something behind it. Architects who have specified the blocks are enthusiastic about them. The blocks are all that the manufacturers claim for them and more. They are stiffer by actual test than old fashioned brick walls, drier and more fireproof than concrete, and, according to the manager, are more economical than either.

It is claimed these blocks keep out the cold in winter time and protect the interior of the house from heat in summer. Manager Cannon says they readily appeal to the man who wants a fireproof stucco house, since the plaster can be easily and effectively applied to the blocks, both inside and out. With partitions of the same material there is absolutely nothing left to burn. On the opposite page will be found a list of the many California buildings that have been built of Denison interlocking tile the past year.

THE A, B, C PRIMER OF GOOD BUILDING

The Denison Block Company has recently gotten out a unique booklet styled "A Primer—the A, B, C of Good Building." The book tells what Denison interlocking tile will do, the uses to which it can be put, and the cost of construction as compared with other materials. The fact that interlocking tile is non-conductive—in other words, it protects from the extremes of outside temperatures, is a feature that cannot be overlooked, as is the fact that the tile provide a strictly fireproof wall. Illustrations are given to demonstrate the twelve lessons which constitute the contents of the primer. A copy of the book will be mailed free to any reader of this magazine on application to the Denison Block Company, 310 Ochsner building, Sacramento.

Architectural Exhibition

The Pasadena Music and Art Association will hold an architectural exhibition during the first week in April—from April 3 to 11. The work will be arranged in the Stickney Memorial building, and will be free to the public each day, including Sunday afternoons.

An Important Decision for Architects

There will be general satisfaction among architects over the clear-cut decision of the Minnesota supreme court on the question of a lien against land to secure pay for plans. The lawsuit which resulted in this interpretation of the lien law was brought by Messrs. Long, Lamoreaux & Long of Minneapolis against Louis Andersch, also of Minneapolis. The opinion given by Judge Bunn is as follows:

1. An architect who, under contract with the owner of land, furnishes plans and specifications for the construction of a building thereon, is entitled to a lien upon the building and land upon which it is constructed, though he does not supervise the construction.

If the owner, after the plans are furnished, of his own volition and without fault of the architect abandons the construction of a building on the land, the architect has a lien on the land. An actual improvement is not necessary to a lien.

2. The contract between the architect and the owner was that the former should furnish plans and specifications for and supervise the construction of the building for an entire consideration based on a percentage of the total cost. The lien statement was filed within ninety days after the owner repudiated the contract. It is held that such statement was filed in time, though the last work on the plans and specifications was done more than ninety days prior thereto.

Leaders in Their Line

The Yager Sheet Metal Company let very few good Oakland contracts "get by" them, and architects speak well of their work. A few recent contracts for sheet metal work are here enumerated:

Lodi High School, Lodi, Cal.; Land hotel, Sacramento, Cal.; Durant school, Oakland; Park and Division school, Oakland; Fremont High school, Oakland; Streit hotel, Oakland; Rey hotel, Oakland; Elks' Club, Berkeley; Bauer apartments, Oakland; Central National Bank, Oakland; Commercial building, Oakland; I. O. O. F. building, Oakland.

Fresno Architectural Firm Dissolves

The firm of Swartz, Hotchkin & Swartz, Fresno architects, by mutual consent have discontinued their partnership.

A. C. Swartz and Frederick L. Swartz will continue in business at their former location in the Rowell building. The former will give attention to structural engineering, while the other will devote his time to the architectural work.

R. B. Hotchkin has taken an office in the same building and will continue the practice of architecture.

Roofing Oakland Schools

Among the firms that have done the roofing of Oakland's new school buildings are the Paraffine Paint Company of San Francisco, the National Roofing Company of Oakland, and J. R. D. McKenzie, also of Oakland. These concerns have supplied reinforced Malthoid, composition and tile roofs, the latter material being supplied by N. Clark & Sons.

Contractor Jesse Steere Sues P. P. I. E.

Jesse E. Steere, a San Francisco contractor, has filed suit against the Panama-Pacific International Exposition Co., Harris D. H. Connick, chief of its department of works, and Cesare Formilli, who has charge of the Italian building and exhibits, to recover $50,000 damages for alleged false imprisonment.

Steere alleges that he was arrested by Exposition guards and restrained of his liberty for three hours. He says the arrest was without cause, that force was used and that he was threatened with bodily injury.

"Steere has the contract for the plaster work on the Italian building," said Walter H. Linforth, his attorney. "He has had trouble with the Exposition authorities, as they changed their mind every few days as to the way in which they wanted the work done.

"He wanted them to put everything in writing, so their differences could be arbitrated. They refused to do so.

"He went to the Exposition grounds to get his plans. When he entered his office on the grounds, a guard told him that if he touched the plans, he would be arrested. Steere put the drawings in his pocket, whereupon he was arrested and taken to the Service Building."

Santa Barbara Highways and County Hospital

The proposed bond issue, upon which the county is soon to vote, will aggregate $1,450,000. It will provide for a system of permanent roads throughout the county, a paved highway through the Cuyama to connect with San Joaquin Valley at Maricopa, and with the State Highway near Santa Maria, and for bridges on the State Highway, on which work has already been begun.

County Highway Commissioner George M. Williamson states that the report includes $330,000 for bridges; and $350,000 to build a new grade over the San Marcos Pass, with macadam on the north side and oil surface for the balance of the grade. For the Cuyama road the commissioners have allotted $90,000.

The report also includes $100,000 for a county hospital and between $15,000 and $20,000 for a detention home.

San Francisco's Engineering Work Given Publicity

A recent number of the Engineering News devotes about forty pages of its space to a detailed account of the engineering work done in San Francisco during recent years. It covers all the activities of the city, of the Harbor Commission and of the Exposition. The article sets forth a stupendous amount of engineering work accomplished during the past seven years, a task which has not been equaled by any city in the country.

The article is from the pen of Assistant Engineer A. J. Cleary and is well written. City Engineer O'Shaughnessy contributes a few words of commendation to his predecessor, Marsden Manson, and to his assistants, Engineers Hunt and Ransom.

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Current Prices of Building Materials

These quotations furnished by reliable San Francisco and Los Angeles dealers

(Names and addresses will be supplied upon request.)

SAN FRANCISCO PRICES

Common Red Brick, $7.50 per M, ex. cars.
No. 1 Pressed Brick, $35.00 to $40.00 per M; Wire cut, $35.00 per M.
No. 1 Red Pressed Brick, $20.00 to $30.00 per M.
Red Stock Brick, $14.00 per M.
California Portland Cement, C/L $2.30 per bbl.; L.C.L. $2.55 per bbl.
White Cement: Atlas, $6.00; Medusa, $6.00 per bbl.
Sand and Gravel mixed, 70c per ton, F. O. B. cars.
Sand (washed, screened river sand) 75c per ton, F.O.B. cars.
Bank Sand, $1.00 per cu. yd.
Roofing Gravel, $1.40 per ton.
Crushe'd Rock or Gravel, 75c per ton.
Red Roofing Tile, $22.00 to $25.00 per square, laid.
Brick Lime, $1.35 per bbl., C/L.
Finish Lime, $1.50 per bbl., C/L.
Hardwall Gypsum Plaster, $11.00 per ton, carload; 1150 per ton, ex. warehou se.
Oregon Pine, Rough Common, 1 x 3 to 1 x 10, $14.00.
Oregon Pine, Rough, 2 x 3 to 2- 12, $15.00.
Oregon Pine 1 x 4 T. & G. Flooring, No. 1, $31 per M; No. 2, $-+8; No. 3, $26.
Oregon Pine T. & G. Ceiling, No. 1 and 2 mixed, $26 to $28.
Redwood, Rough Common, 1 x 4 and up, $20.00.
Redwood, Rough Common, 2 x 3 to 2 x 10, $20.00 to $22.00.
Redwood Rustic, No. 1, $35.00; No. 2, $32.00.
Redwood Ceiling, No. 1, $29.00; No. 2, $26.00.
Redwood Shingles, No. 1, $2.45 full count.
Red Cedar Shingles, Star-A-Star- $2.60 full count.
Pine Lath, $2.40 per M.
Metal Lath, 13 to 25c per yd., according to quality.
1 x 3 Oak Flooring, Q. S. Clear, $120.00 per M; Select $80.00 per M.
½ x 2½ Oak Flooring, Q. S. Clear, $96.00 per M; Select, $74.00 per M.
1 x 3 Maple Flooring Clear, $75.00 per M; Clear White, $105.00 per M.
White Lead in Oil, 8¼c per lb.
Dry Red Lead, 8c per lb.
Boiled Linseed Oil, 63c gal. Raw Linseed Oil, 61c gal.
Turpentine, per gallon, 63 to 70c in bbls.
Dry Shellac, 35c per lb., variable.
Hyloplate Blackboard, 25 to 35c per foot, installed.
Composition Flooring, 25 to 30c per foot, laid.
Genuine Slate Blackboards, 40 to 50c per foot, erected

LOS ANGELES PRICES

Common Red Brick, No. 2, $4.50 per M.
Clinker Brick, $9.00 per M.
Pressed Brick, $35.00 per M.
Enameled Brick, $65.00 per M.
Red Roofing Tile, $12.00 and $15.00 per square (not laid).
White Cement, $6.00 per bbl.
Portland Cement, $2.30 per bbl.
Lime, $1.50 to $1.75 per bbl.
Hardwall Plaster, per ton, $9.90 ex. whse.
Oregon Pine, Rough Common, 1 x 3 up, $19.00 to $22.00 per M.
Oregon Pine, Rough Common, 2 x 3 up, $17.00 to $21.00 per M.
Oregon Pine Flooring, 1 x 4, No. 1, $40.00; No. 2, $35.00; No. 3, $22.50 per M.
Oregon Pine Ceiling, 1 x 4, No. 1, $36.00; No. 2, $31 00.
Redwood, Rough Common, $20.00 to $24.00.
Redwood Rustic, No. 1, $38.00; No. 2, $33.00 per M.
Redwood Ceiling, 1 x 4, No. 1, $33.00; No. 2, $28.00 per M.
Redwood Shingles, 4 bdls. to M, No. 1, $2.25; No. 2, $1.75.
Red Cedar Shingles, 4 bdls. to M, Star-A-Star, $2.75.
Pine Lath, 1½ in. x 4 ft., $3.25 per M; 1⅝ in.x 4 ft. $3.65 per M.
White Lead in Oil, 8½c per lb.
Red Lead, dry, 8½c per lb.
Raw Linseed Oil, bbls., 65c gallon.
Boiled Linseed Oil, bbls., 65c gallon.
Turpentine, bbls., 63 to 70c. gallon.
Crushed Rock and Gravel, $1.65 per yard.
Sand, 85c per yard.

SACRAMENTO PRICES

Common Brick, $7.00 per M, C/L.
Pressed Brick, Wire Cut, $30.00 per M, C/L.
Portland Cement, $2.40 per bbl. carloads.
Crushed Rock and Gravel, 65c per ton, ex. cars.
Sand, $1.00 yd. on cars.
Roofing Gravel, $1.50 per ton.
Lime, $1.35 bbl.
Hardwall Plaster, $13.00 per ton, ex. whse.

STOCKTON PRICES

Common Brick, $7.75 per M, del.
Face Brick, Wire Cut, $31.00 per M C/L.
Cement, $2.40 per bbl., C/L.
Crushed Rock and Gravel, 90c ton.
Sand, 90c.
Roofing Gravel, $1.50 per ton.
Lime, $1.35.
Hardwall Plaster, $13.00 ex. whse. per ton.

FRESNO PRICES

Common Brick, $9.50 per M, del.
Face Brick, Wire Cut, $35.00 per M, C/L.
Cement, $2.84 per bbl., C/L.
Crushed Rock and Gravel, $1.35 per ton.
Black Face Brick, $25.00 per M—F. O. B.
Sand, $1.00 per yd., del.
Roofing Gravel, $1.85 per ton.
Lime, $1.50 bbl.
Hardwall Plaster, $14.00 per ton, ex. whse.

BAKERSFIELD PRICES

Common Brick, $9.00 per M, del.
Face Brick, Wire Cut, $37.00 per M, C/L.
Cement, $2.77 per bbl., C/L.
Crushed Rock and Gravel, $1.80 per ton.
Sand, $1.00 per yd., del.
Roofing Gravel, $2.00 per ton.
Lime, $1.50 per bbl.
Hardwall Plaster, $15.00 per ton, ex. whse.

CHICO PRICES

Common Brick, $11.00 per M, del.
Face Brick, Wire Cut, $35.00 per M, C/L.
Cement, $2.65 per bbl.
Crushed Rock and Gravel, 85 to 90c per ton, C/L.
Sand, $1.00 per yard.
Roofing Gravel, $1.50 per ton.
Lime, $1.40 bbl.
Hardwall Plaster, $14.00 per ton, ex. whse.

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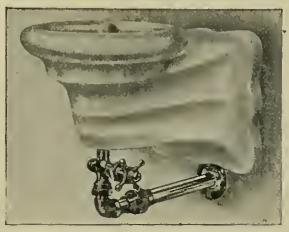

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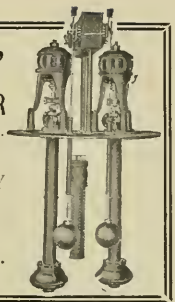

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Hauser Window Forges Ahead

The rapid accumulation of orders by the Hauser Reversible Window Company taxes its large and up-to-date plants to keep up with demands. The factory at 204 First street, for the manufacture of the arms for metal windows, and the shop at 1927-1935 Market street are equipped with the most improved machinery, and the Hauser Reversible Window Company invites architects and contractors to inspect same. Among recent installations of their windows may be named:

Apartment at Hyde and Chestnut streets, C. A. Meussdorffer, architect.

Santa Cruz High School, Wm. H. Weeks, architect.

Two Richmond school houses; Stone & Wright, Stockton, architects.

Eldorado School, Stockton; Stone & Wright, Stockton, architects.

Also many other buildings now under construction. The mill men are said to like the Hauser window, on account of its simple frame construction.

Contract for Power House

The engineering department of the United Railroads has awarded a contract to Williams Bros. & Henderson, Holbrook building, San Francisco, for the construction of a steel and brick power station Eighth avenue and Geary streets, San Francisco, for about $7,000. The same firm will build the new $75,000 Christian Science Church in Oakland from plans by Architect W. A. Newman.

Artistic Woodworking
(Contributed)

Perhaps no firm can be relied upon with more confidence when an especially fine piece of cabinet work is desired as can A. J. Forbes & Son of this city, the oldest wood fumers in San Francisco, and possibly in the United States, having been established in 1851. Some of their recent work deserves special mention and commendation. It includes:

Alaska Packers' exhibits at the Exposition: Seven cabinets, said to be the very finest in the fair.

The dining room furniture in the California building.

The booth of the Pacific Coast Fisheries.

Seven different exhibits of Uruguay, the woodwork in all of which has been highly spoken of.

The remodeling of the interior of the Crocker National Bank.

The counters in the Firemen's Fund building.

Choir stalls for Stanford University (Bakewell & Brown, architects).

Dining room cabinet work and mantel in halls, also main entrance door of Kohl residence.

The highly finished specimen of California redwood (said to be the most remarkable ever shown), exhibits of Standard Varnish Co. at Exposition.

These and many others that could be mentioned illustrate the tendency of modern construction to include the finest workmanship. Certainly the East could provide no higher class work than that produced by A. J. Forbes & Son of San Francisco.

Opens Down Town Office

John Monk, who built the Horticultural Palace at the Panama-Pacific Exposition—a building that has called forth much praise from the admiring throngs—has opened an office in the Sharon building, San Francisco. Telephone connections have been installed.

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One of the largest orders for ornamental brick ever placed on the Pacific Coast has been contracted for by the J. W. Robinson Co. from the Pacific Sewer Pipe Co. of Los Angeles. The deal calls for the early delivery of approximately 300,000 separate bricks to be used in the facing of the huge department store now being built by the company at Seventh street and Grand avenue, Los Angeles. These bricks weigh seven pounds each, making a total of 2,100,000 pounds, or 1050 tons—fifty-two carloads.

The brick will be of a gray mottled color with enameled finish, and will be made of Southern California clay. The manufacturers promise to have the huge order ready by the time it is needed. The trim of the building will be of terra cotta.

The new "Robinson's" will be not only one of the largest but one of the handsomest mercantile establishments in the country. Extending along the south side of Seventh street from Grand avenue to Hope street, it will have a depth of 135 feet on each of the last-named thoroughfares. Its height will be seven stories. The reinforced concrete forms for the third story are now being placed.

Johnson Oil Burners in Demand

The Johnson Oil Burner Co. of San Francisco and Los Angeles reports business conditions brisk in Southern California. The company has recently installed crude oil burning plants in the Horace Mann, Temple and Fremont school buildings at Long Beach; the Magnolia and Longfellow school buildings at Riverside; La Habra and Beverly school buildings; the Danziger residence at Beverly; Renshaw, Jones & Sutton factory building; Casa Loma hotel, new Santa Fe depot, San Diego, and Imperial Baking Co. at El Centro. Their Whirlwind distillate burners have also been installed in the Olivet, Berg, Key West, Lily, Lake View and Ensenada hotels in Los Angeles; the Glendale, Claremont, Redlands and Oxnard school buildings, and the St. John's hospital at Oxnard, and also the Riverside hospital.

Oakland Branch Bank Building

Architect Walter Reed has prepared plans for a one-story classic bank building for the Oakland Bank of Savings. It will be erected on Fifth street, between Union and Magnolia, and will be a branch of the main institution. Construction will be of steel, stone and brick and the estimated cost, including equipment, is $30,000.

Removal Notice

O'Brien Bros., Inc., have moved from the Clunie building to 240 Montgomery street, San Francisco.

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That door, crude as it was, possessed one virtue that the doors of civilized man did not possess up to the Twentieth Century — IT WAS FIREPROOF.

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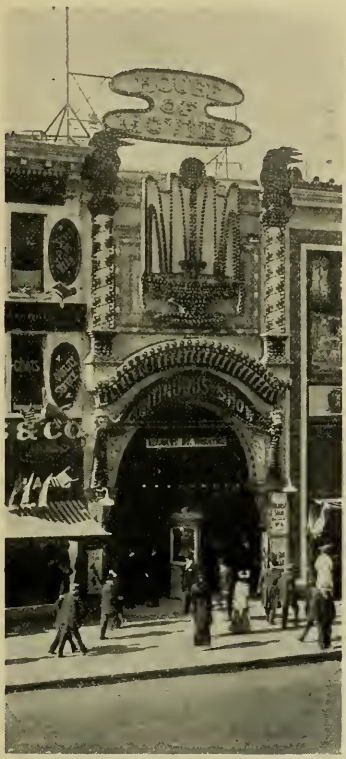

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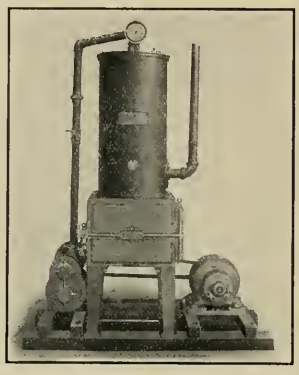

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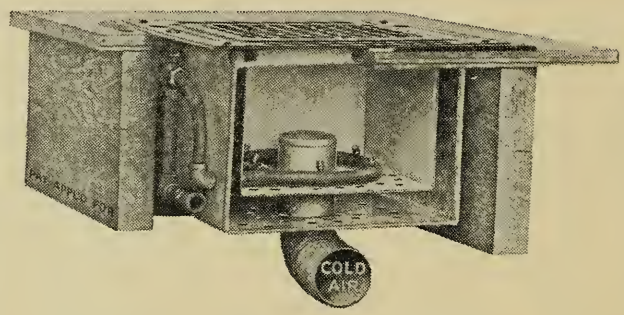

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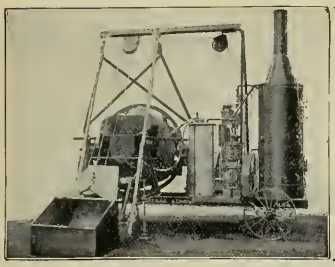

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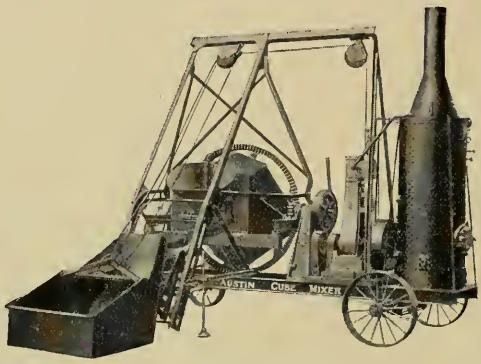

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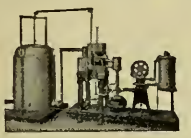

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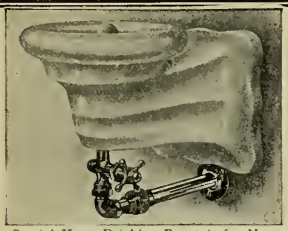

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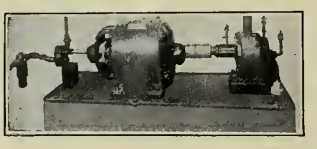

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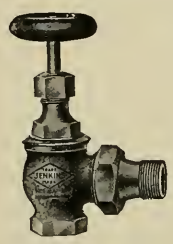

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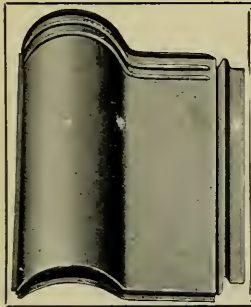

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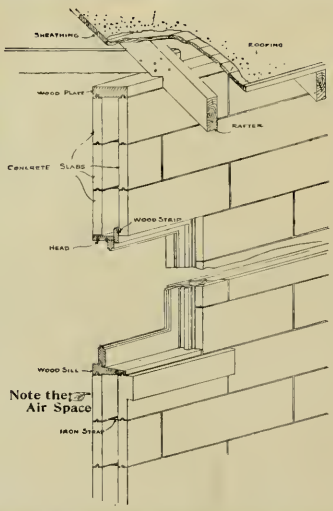

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